NATURE MAGAZINE

MARCH 1930 35¢ VOL. 15, NO. 3

BUY a NATURE BOOK THIS MONTH

Many requests received from the readers of NATURE MAGAZINE asking for the recommendation of books in the various fields of Nature and science indicates an existing demand. This demand is for books that are authentic, practical and worth adding to one's library. It is apparent that it is the duty of the AMERICAN NATURE ASSOCIATION, through these pages, to assist its members by suggesting the worthwhile volumes.

Each month this page will be published in NATURE MAGAZINE. On it will be listed books in two classifications. The first group includes those volumes of current publication regarded by the most competent authorities, consultants of this Association, as outstanding and valuable. The second group includes those books in various fields which are regarded as somewhat standard works and yet are still available from the publishers.

Consider these lists of books, your own particular interests in Nature and your present library, and add an excellent Nature book each month. Send the listed price (which includes postage) of the volume to:

BOOK EDITOR, NATURE MAGAZINE
1214 16th STREET WASHINGTON, D. C.

Nature Books of Recent Publication

IN THE ZOO—W. Reid Blair. Animal observation $2.60
THE UNIVERSE AROUND US—Sir James Jeans. Fascinating astronomy $4.60
MY TROPICAL AIR CASTLE—Dr. Frank M. Chapman. Tropical wild life $5.15
WINGS OF A BIRD—Herbert Ravenal Sass $2.60
NATURE NARRATIVES—Austin H. Clark $1.10
PERENNIALS OF FLOWERLAND—Alice T. A. Quackenbush. Who's who of perennials $1.60
GARDEN CINDERELLAS—Helen M. Fox. Lily culture. $5.15
ROMANCE OF THE PLANETS—Mary Proctor. The skies. $2.60
BURGESS SEASHORE BOOK FOR CHILDREN—Thornton Burgess. $3.10
THE NATURAL HISTORY OF SELBORNE—Gilbert White $15.25
MUSHROOMS OF FIELD AND WOOD—Margaret McKenny. Handbook. $2.00
THE BIRD BOOK—Charles P. Shoffner. $2.00
WILD ANIMAL PETS—William and Irene Finley. $3.00
FORESTS AND MANKIND—Pack & Gill. $3.00

Recommended Books for the Nature Library

BIRDS

COLOR KEY TO NORTH AMERICAN BIRDS—Chapman. $3.65
HAND BOOK OF BIRDS OF WESTERN U. S.—Bailey. $6.25
HANDBOOK OF BIRDS OF EASTERN N. A.—Chapman. $4.15
BIRDS OF THE OCEAN—Alexander $3.65
PRACTICAL VALUE OF BIRDS—Henderson $2.60
BIRD GUIDES—Reed. (In two parts, $1.50 each)

MAMMALS

FIELD BOOK OF NORTH AMERICAN MAMMALS—Anthony $5.15
OUR WILD ANIMALS—Moseley $3.10

GARDENING

BOOK OF ANNUALS—Hottes $1.65
BOOK OF PERENNIALS—Hottes $1.65
FOUR SEASONS IN THE GARDEN—Rexford $2.65
ROCK GARDENS—EVERGREENS—SHRUBS—GLADIOLUS—IRISES—DAHLIAS—Rockwell ..... $1.00 each

WILD PLANTS

FIELD BOOK OF AMERICAN WILD FLOWERS—Mathews. $3.65
FIELD BOOK OF COMMON GILLED MUSHROOMS—Thomas $3.65
FIELD BOOK OF AMERICAN TREES AND SHRUBS—Mathews $3.65
BOOK OF WILD FLOWERS FOR YOUNG PEOPLE—Mathews $2.60
WILD FLOWERS AND FERNS IN THEIR HOMES AND OUR GARDENS—Durand $3.65
THE FLOWER FINDER—Walton $3.10

ASTRONOMY

A FIELD BOOK OF THE STARS—Olcott $1.60
THE BOOK OF THE STARS FOR YOUNG PEOPLE—Olcott $2.60

REPTILES AND AMPHIBIANS

REPTILES AND AMPHIBIANS—Barbour $3.65

INSECTS

FIELD BOOK OF INSECTS—Lutz $3.15

GENERAL MANUALS

MANUAL OF THE VERTEBRATE ANIMALS OF THE NORTHEASTERN U. S.—Jordan $4.20

Surprisingly Moderate in Cost

Things to see and do in the Wonderland

New Gallatin Gateway to Yellowstone, 170-mile motor trip (no added cost) . . . dude ranches . . . Spokane and the Inland Empire . . . Seattle and Tacoma, world ports . . . Rainier National Park—glacier-clad monarch mountain . . . Olympic Peninsula, Indians, snow peaks, big game, ocean beaches . . . Puget Sound's myriad isles . . . cruises to old-English Victoria and Vancouver . . . Mt. Baker's ice-clad slopes . . . up the "inside passage" to Alaska, land of midnight sun.

SUMMER VACATIONS IN THE GLORIOUS NORTHWEST

-fashioned to your own ideas-

This very day decide where you'll vacation this Summer. Choose the Northwest Wonderland, the homeland of enchantment, romance and Nature's marvelous handiwork.

Stay as long as you like—every day delightfully different. If time is limited, a fortnight will suffice to enjoy the crowning glories.

Costs? Surprisingly moderate! Well within your means! Low round trip fares this Summer. Return the coupon below and we'll send you illustrated literature to help you plan your vacation trip.

Glance at some of the Northwest's attractions on this page. Picture the fun you'd have. Can you conceive of anything more thrilling, more enjoyable, more memorable than a Summer trip to this wonderland?

Fill in the coupon below. Our specialists in Western Travel will see to it that you get five-fold value in happy enjoyment for every dollar you spend.

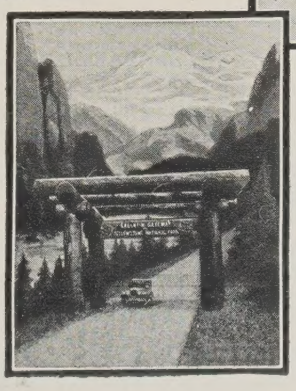
You can travel independently or with escorted tour parties.

THE MILWAUKEE ROAD

ELECTRIFIED OVER THE ROCKIES TO THE SEA

CHICAGO MILWAUKEE ST. PAUL AND PACIFIC

Route of the New Olympian



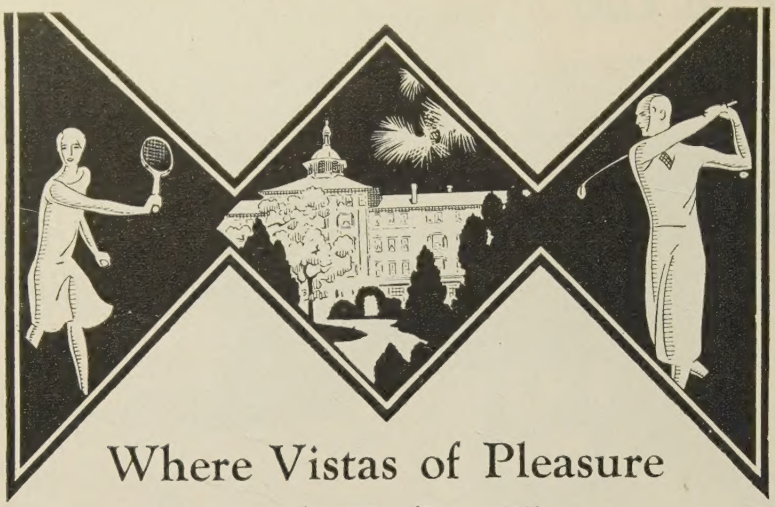
Mail this coupon

Geo. B. Haynes, Passenger Traffic Manager
The Milwaukee Road, 709 Union Station
Chicago, Illinois

Send me full information about tours to: ☐ Yellowstone ☐ Inland Empire (Spokane and Lake Region) ☐ Rainier National Park ☐ Puget Sound Country ☐ Olympic Peninsula ☐ Alaska ☐ Black Hills. ☐ Escorted, all-expense tours. I have.....days' vacation and about $.....to spend.

*Name*_____

*Address*_____ 6C1-8



Where Vistas of Pleasure Stretch Before You

Step out on the warm, hospitable Verandah of the new Pine Needles Inn at Pinehurst, N. C. Drink in the fragrance of long-leafed pines, the beauty of wooded hillsides. Listen to horses' hoofs on winding bridal paths, the sounds of good times on famous Donald J. Ross golf courses. Not bad to be alive where the air tingles with jollity and relaxation, and delicious meals are worthy of healthy appetites.

The exclusive Pine Needles Inn (now open) is suggestive of the old English Inn atmosphere and offers every luxury. The luxurious Carolina Hotel and New Holly Inn are also open.

For illustrated booklet or reservations address
General Office, Pinehurst, N. C.

Pinehurst is only 15 hours from N. Y. on the new special through train, "The Carolina Golfer". Leave N. Y. at 5:45 P. M. Arrive at Pinehurst at 8:45 A. M. next morning

Pinehurst
NORTH CAROLINA
America's Premier Winter Resort

$3.00 FOR ROOM & BATH

HOTEL PICCADILLY
45TH ST. W. of BROADWAY
NEW YORK

In the Heart of TIMES SQUARE—
Brand new—
Luxurious—
Exceptional!
EACH room has bath, circulating ice water, electric fan!
Wire at our expense for reservations.
F. D. SOFIELD, Managing Director

The
BELLEVUE-STRATFORD
PHILADELPHIA

Centre of Philadelphia Social Life
Choice of the Particular Traveler

J. M. ROBINSON, *Manager*
AFFILIATED HOTELS
Waldorf-Astoria New York

Write for your
copy of "ON WESTERN TRAILS"
Travel Dept., NATURE MAGAZINE

MANY European pilgrimages for 1930 will center around the Passion Play at Oberammergau, in the Bavarian Alps, where, every decade since 1633, the villagers have portrayed this magnificent event to carry out their pledge, made at a time of pestilence nearly three hundred years ago. The story of these players is well known. From early youth, their sole aim in life is to be able to play a part in the greatest of modern tragedies,—their entire existences are devoted to one purpose. More than 300,000 people are expected to visit this little town, beautifully situated on the banks of the shining Ammer river, during the season, which lasts from May 6 to September 28. The Canadian-Pacific Steamship Co. will help arrange for tickets to this drama, and is one of the many lines offering excellent service to the Continent.

* * *

Among the many guilds that mark the present age, the Travel Guild serves a most useful purpose, which is to show Europe completely, luxuriously and reasonably to Americans. In 1930 it is offering a number of all-motor trips on the Continent, the first, it is believed, that have come into existence. These tours have the advantages of motor travel, and in addition penetrate the heart of the countries visited rather than merely fringing the much-travelled routes. They vary in duration from twenty-nine to seventy-four days, cover from three to ten countries, and range in cost from $395 to $1,007. In addition, several shorter trips are planned, among which is a very delightful jaunt through rural England, lasting a week, which costs but $85.

* * *

As a part of its service, the Cunard Line is adding, in connection with certain of its ships, personally-conducted land excursions to Germany, the Continent generally, Czecho-Slovakia, Ireland, and Lithuania. These vary in length and expense, but it is promised that they will be very different from the usual run of tours. The conductors are all employees in the Cunard service and especially trained for the work.

* * *

"Wings over Europe" is more than a play,—it is an actuality. A host of air companies have sprung up and offer prices that are not tremendously higher than rail rates, accommodation considered. Air-liners ply between the leading cities with

WELCOME TO
Hotel
MANHATTAN
157 West 47th St., New York
Large room and bath ..... $2.50 to $3
Double ..... $3.50 to $5
"In the heart of Times Square"
Convenient to stores, theatres and garages.

the regularity of trains. One may go from London to Geneva, Marseilles, Ajaccio, Tunis, Ostend, Zurich, Rotterdam, Copenhagen, Berlin and nearly any other city in from fifty minutes to eight hours. The K. L. M. Royal Dutch lines have a network of passenger services blanketing the continent. If you are going to Europe, get in one air trip, at least, and make it less conventional than the usual Paris-London trip.

* * *

The West Indies, in March, are increasingly popular. A host of steamship companies are offering attractive rates for cruises throughout this section guaranteed to put back the bloom of health on anybody's cheeks. The Royal Mail Steam Packet Company are listing popular-priced vacation cruises lasting fourteen days for as low as $140. These include Nassau, Havana, Santiago, Kingston and Port-au-Prince. Somewhat more sumptuous and lengthy are the trips of the Cunard Line, which now has four liners plying in this trade. Its trips range from nine to eighteen days, and cost from $175 up.

* * *

The Pan-American Airways, which link the northern cities with the sands of the Bahamas, Central America, and South America, by a bond of but a few hours, offer some of the most delightful trips on the American continents. The principal ports of the West Indies are covered three times a week by great tri-motored planes as safe as trains, and Miami and Brownsville, Texas, have become practically adjoining cities with Cristobal, Baranquilla, Panama City, San Juan and a number of others. In flying from San Lorenzo to Havana one crosses the entire Yucatan country, inaccessible by rail, where once the Maya civilization ruled and where the ruins of their cities rise grotesque from the impenetrable jungle. From the air one can see for great stretches both oceans—the Atlantic and the Pacific, at once. This is the ideal way to travel, and one which, incidentally, another generation will be thoroughly devoted to.

* * *

The Alaska and the Yukon Territory country is picturesque, romantic and different. In summer and late spring, it is as beautiful as a tropic country, and as comfortable as any spot in the United States. To follow through the Atlin, Klondike, and Tanana districts, along the famous Trail of '98; to see the marvels of the Sawtooth range, Five Finger Rapids, Dawson City; to roam the streets of Skagway, a city of blood and thunder at one time, or to traverse in pleasant steamers the lakes such as Atlin is to enjoy a marvellous treat.

* * *

Although the announcement of the 1930 plans for the American Nature Association came but a short while before this was being written, a number of individuals had already "signed up" for the Inner Passage trip, and several for Jasper Park, Glacier and Yellowstone. If you have not received a copy of "On Western Trails" and are thinking of partaking of a personally-conducted, naturalist-led trip with a group of "real people," please advise this department.

to America's greatest adventureland

There's a mountain trail that dares you to high adventure atop a sure-footed horse along its winding way . . . there's a cayuse down in the corral that nickers with impatience to be off and away . . . up along the face of some frowning battlement of nature, over the top and up, up, under the very clouds . . .

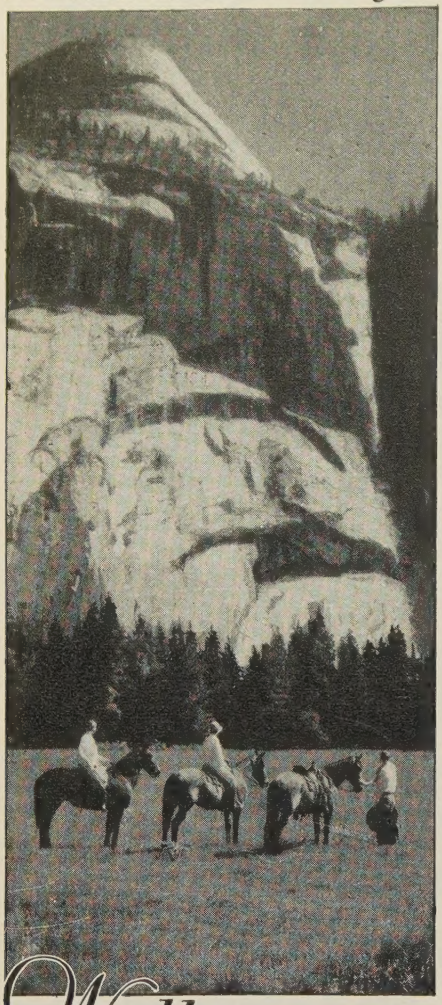
Glacier Park skies are blue, and the mountain torrents promise things of brighter, happier days this summer when *you* come out . . .

Come and taste high adventure with your own kind of folks . . . riding the trails through the fastnesses of Glacier Park, where Nature built her greatest playground for *you!*

The ticket agent in your own city—or Great Northern travel headquarters at St. Paul—will be glad to give you Glacier Park literature, and complete information about the palatial Great Northern trains that take you to Glacier National Park—the new *Empire Builder*, the luxurious *Oriental Limited.*

The New
EMPIRE BUILDER
The Luxurious
ORIENTAL LIMITED

OVERNIGHT
from San Francisco or Los Angeles



Walls of the world

The eternal wonder is Yosemite's towering *sheerness!*

Stand at the foot of majestic Glacier Point, look up . . . and a jutting stone lip is two-thirds of a mile overhead. Across the meadows, bold El Capitan and brooding Half Dome stand so tall you think they are just within reach . . . yet they're miles away, and this clear, clean air is playing you tricks again!

All year **Yosemite has new things to do . . . here stalwart peaks go up to the sky, and waterfalls plunge from their shoulders . . . and here even resting is a vast new thrill.**

At the colorful Ahwahnee, revel in the comforts of California's finest resort hotel. Rates from $10 a day, American plan. Other accommodations as low as $1.50, European.

All-expense tours from Merced, California, for from $30 to $76.25, cover 2 to 4 days in Yosemite. Ask any travel agent, or write for scenic folders: Dept. 130, Yosemite Park and Curry Co., Yosemite National Park, Calif.

YOSEMITE
& MARIPOSA BIG TREES

NATURE IN PRINT

Stranger than Fiction

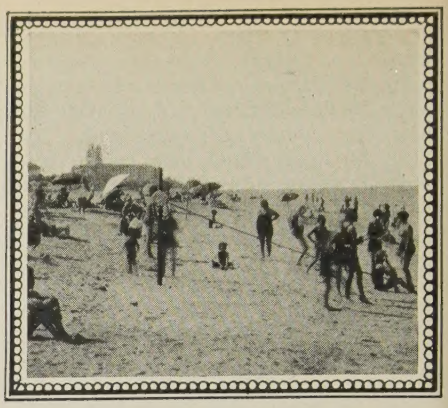
To the scientist, particularly the biologist, it must be a constant, never failing mystery why so much fiction is written, when on every side, in the myriad aspects of life, realities pulse and glow with more romance, more climax and more thrills than ever did a Jules Verne tale. Consider, for example, *Nature Narratives,* by Austin H. Clark of the National Museum. In the space of 132 pages, Dr. Clark has crowded true tales of some of the strangest creatures of life—the water sprite, the sea-snake, sea horses, the Cecropia moth, enormous earthworms, and sundry other members of the animal kingdom. He tells about footprints in the rocks, sea serpents, why the sea dies, how the shark intoxicates, how some flies wave their eyes on stalks,—and tells about them as one revealing important secrets. There is little doubt but that the purpose of the book—"to stimulate the reader to delve further into the subject of biology and to form a real acquaintance with the living world"—is served; in fact, it is most difficult to keep down a growing desire to go a-fielding to make discoveries for oneself following a perusal of it. The publishers, Williams and Wilkins, Baltimore, Maryland, announce that this is Volume I. We will eagerly watch for Volume II. The price is one dollar.

North American Mosquitoes

Many of us can remember when malaria was supposed to be caused by night air, marsh atmosphere, or even mist from waterfalls. Then, about 1900, several eminent entomologists, working more or less independently, discovered that this widespread disease was carried by mosquitoes of certain species, and that other species were responsible for yellow fever. These discoveries led to means of repressing the vectors, and many areas, from which the white race had been practically barred, were opened to peaceful occupancy. The study of such relations has proceeded, and a vast literature has resulted. Two other diseases, dengue and filariasis, less well-known but of serious importance, have been added to the list of maladies that are spread by these literally pestiferous insects.

Mosquitoes are of great interest to lovers of the out-of-doors. Apart from their disease-bearing potentialities, their stings, and to some sensitive persons their mere presence, make life in their company a wearisome ordeal. About 2,000 species are known in the world, of which the Americas have more than 500. North America, north of Mexico, has about 123 species. These breed in marshes, field and woodland pools, puddles, rainbarrels, cisterns, discarded tin cans, and leaves of pitcher plants. Many of these habitats harbor several species that succeed each other as the season advances. Most are at least irritating; a few are harmless, as far as known.

To furnish means of identifying, studying, repressing, or avoiding the more dangerous



Just What IS Your Pleasure?

IN WEST PALM BEACH this year the stock is large and the assortment varied—from bridge under the palms to fishing in sequestered streams or open ocean; from golf in a skin-browning sun, to band concerts under a tropical moonlight.

Thousands of winter guests are rekindling the spark of play. Health, happiness, sheer exuberance of spontaneous delight.

Besides, for the first time the City of West Palm Beach has launched a broad program of recreations and tourist entertainment—play for the elderly, play for the young,, play for the little tots under a matron's supervision. Play-time all the time in this palm-bowered city "Where Summer Spends the Winter".

Living costs are so moderate, too; with 47 hotels and apartments *certifying* their rates. Could heart desire more for an exhilarating winter?

Our free booklet paints the complete picture; and lists the certified lodging rates. Write for a copy, addressing V. G. Swinehart, P. O. Drawer B-58.

WEST PALM BEACH
FLORIDA

Picture Hunters and Nature Lovers

If you want to study and photograph ALASKA fauna and flora in an unspoiled wilderness country

Come To

Kenai Peninsula, Alaska

Moose, Dall Mountain Sheep, Black and Brown Bears and smaller animals. Birds and flowers. Limited to Six Persons at one time.

For detailed information, references, and reservations write to **H. A. Anderson, Lawing, (via Seward) Alaska**

VICTOR Portable STEREOPTICON

Has established the world wide standard of Projection Excellence

SLIDES MADE-TO-ORDER FROM YOUR BEST PICTURES (Negatives or Prints)

Victor Animatograph Co.
299 Victor Bldg.,
Davenport, Iowa.

WRITE FOR **SPECIAL EASY TERMS**

of our North American species is the purpose of a handbook. *The Mosquitoes of North America,* by Robert Matheson, Professor of Entomology of the New York State College of Agriculture at Ithaca, New York. The illustrations are many and serve to make clear the life histories of the species, and the protective measures. The book is from the press of C. C. Thomas, Springfield, Ill., and Baltimore, Md. The price is $5.50.

E. A. P.

Nature Books

Under the editing of Hartley H. T. Jackson of the Biological Survey, the Charles C. Thomas Company is issuing a series of Nature Books, covering a miscellany of subjects—birds, mammals, stars, clouds, rocks, trees and a host of other aspects of Nature. Their purpose is defined to be to "disperse authentic natural history in many aspects in a dignified, readable and appealing form." The introductory volume, *Denizens of the Mountains,* by Edmund C. Jaegar, has just been issued, and if the rest maintain the high level set by this book, their usefulness in the schoolroom and library cannot be doubted. As one who knows them and has studied them, and who has—still more—found a facile pen for expressing his love for them, Mr. Jaegar traces the wood rat, the cony, the mountain chickadees, the Clarke nutcracker and a host of other birds and animals over the High Sierras and Rockies, with no attempt to romance or anthropomorphize. This volume can be obtained from Chas. C. Thomas at Springfield, Ill., for $2.

Selborne de Luxe

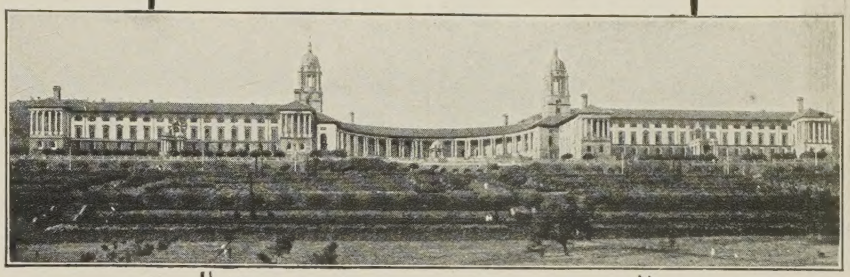
Gradually Gilbert White's *Selborne* has attained the position of a classic. This has arisen not alone out of its interest and value as a natural history document, but also by virtue of its importance as a contribution to English literature. It is not, therefore, our purpose here to review *The Natural History of Selborne,* which now comes to us from the presses of E. P. Dutton and Company. It is rather for us to record that there is now available, for those who can afford it, a perfect Selborne, edited with an introduction by E. M. Nicholson and illustrated with woodcuts by Eric Daglish. It is a beautiful and charming volume; a substantial volume, fit to grace the shelves of every lover of Nature and the outdoors. It will be found listed on our Book Page this month.

Nature Lore

With fellow editorial feeling we greet *Nature Lore,* which came into being with January of this year under the editorship of Carlos Tribble of Pueblo, Colorado, ably assisted at the mimeograph by three other Boy Scouts. Brother Editor Tribble makes the rather broad offer that he will send the magazine free to anyone desiring it. We would take the liberty of suggesting that a stamp or two might help him out if you write to him at the editorial sanctum, 734 Palmer Avenue, Pueblo. Good luck, Brother Tribble and associates; it's a good cause.

SOUTH AFRICA

The New Realm of Travel



The Union Government Buildings at Pretoria

A Mission Bell Tower in Bechuanaland

South Africa invites you to a feast of unrivalled sight-seeing, beneath sunny skies, in an all-year-round climate unexcelled for health-giving stimulus.

Revel in the marvels of nature, in the romance, mystery and colorful contrasts of this travelers' paradise, where luxurious hotels, railroads, fine motor roads, a great variety of outdoor recreation and a delightful hospitality will make your tour an unforgettable delight.

The Director, South Africa Travel Bureau, Room 657-11 B'way, New York City, invites inquiries regarding travel. Ask for booklet OD2.

A Zulu in War Panoply

IDYLE WYLD
A Progressive Camp for Girls

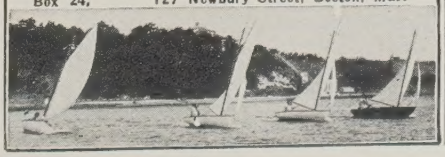
On chain of 27 lakes. 14th season. All camp activities. French conversation. Many trips by canoe, horseback, truck, and motor boat. College graduate staff; doctor and nurse. Enroll early. Write:
Mrs. L. A. Bishop, Three Lakes, Wisconsin

MARANACOOK
Camp for Boys 7-17
READFIELD, ME.
21st year. Mature counselors. Cabins. Elective daily program. Riding. Mountain, canoe and ocean trips. All sports.
WM. H. MORGAN, Director
Hotel Mayflower, 1138 Boylston St., Boston, Mass.

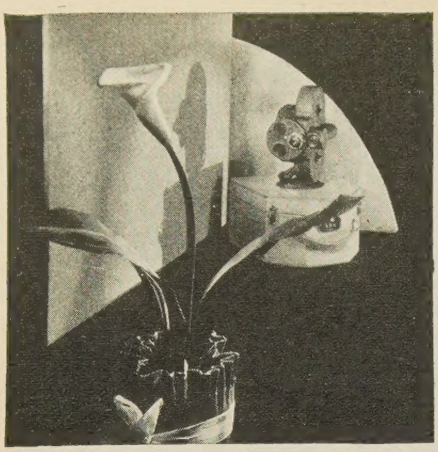
GIRLS Fun GIRLS Frolic GIRLS Facts
WATER AND LAND SPORTS. HORSEBACK RIDING. DANCING. DRAMATICS, etc.
SEASHORE * FORESTS * FARMS * LITTLE RIVERS
Big Museum (Nature, History and Art), Astronomical Observatory, Arboretum, Greenhouses, Educational Apiary, Pet House, Laboratory. Home with camp interests June and September. Full camp activities July and August.
THE CORNUCOPIA HOME-CAMP
The Agassiz Association, Inc.
ESTABLISHED 1875
EDWARD F. BIGELOW, *Director*
ARCADIA
Sound Beach Connecticut
31 miles east of New York City

CAMPS Information
FREE catalogs and expert advice on ALL Boys' or Girls' camps in U. S. (*also U. S. "School Guide"*). Relative standing from official inspections. *State Chartered Information Bureau.* No fees. Call, write or phone:—
AMERICAN SCHOOLS ASSOCIATION
1212 Times Building, New York, or 204-N 17 N. State St., Chicago

Cape Cod Sailing Camps for Girls
QUANSET
Established 1905
On Pleasant Bay, South Orleans, Massachusetts
LEARN to sail at Quanset. Racing in safe Pleasant Bay with Cape Cod skipper. Canoeing, salt water swimming, riding, all sports. Strong organization of able counselors. Results in health building, under medical supervision. Camp farm; safe milk. Nimicutts 5-11. Quansets 12-18. Booklet.
Mrs. E. A. W. Hammatt
Box 24, 127 Newbury Street, Boston, Mass.



NATURE CAMPS
for
Teachers and Nature Lovers in the mountains of central Pennsylvania midst many rare plants and animals.
Penn State Summer Session
First Camp—June 26 to July 17
Second Camp—July 16 to August 6
Intensive Field Work
Special Lectures by Elmer W. Ekblaw, Mrs. Anna Botsford Comstock, J. G. Needham and others.
Illustrated bulletin on request
Professor George R. Green
Director of Nature Camps
State College, Pa.



Filmo 70-D, "master of all personal movie cameras," taking pictures of the growth of a lily, a few feet of film each day

Consider the Lilies with FILMO

First the green shoot, then the leaves, then the bud, then the petals as they open into waxen beauty . . . Starting now, you can have by Easter a movie of the miraculous growth of a lily, taken a little each day, complete on a hundred feet of film.

Merely one of many interesting movies that you can take with Filmo and simple indoor lighting equipment supplied by Bell and Howell. By Easter, myriad outdoor scenes of animal and plant life will await your Filmo.

Choose your Filmo now, the personal movie camera made by the same master hands at Bell and Howell that fashion the professional movie cameras used by the world's leading producers to make the photoplays seen in first run theaters for the past 23 years.

Several models from $120 up are shown and recommended by good camera dealers. Or write for literature.

All Filmos use 50 or 100 foot film

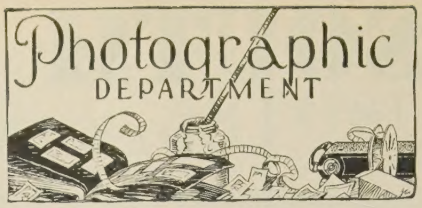
For black and white pictures, Filmo Cameras use Eastman Safety Film (16mm.) in the yellow box—both regular and panchromatic—obtainable at practically all dealers' handling cameras and supplies. Filmo Cameras and Filmo Projectors are adaptable, under license from Eastman Kodak Company, for use of Kodacolor film for home movies in full color. Cost of film covers developing and return postpaid, within the country where processed, ready to show at home or anywhere with Filmo Projector.

BELL & HOWELL

Filmo

"What You See, You Get"

BELL & HOWELL CO., Dept. O, 1813 Larchmont Ave., Chicago, Ill., · New York · Hollywood · London (B. & H. Co., Ltd.) · Established 1907



THE picture herewith is interesting both from the point of view of photography and for what it shows. It was taken by Oscar E. Monnig of Fort Worth, Texas, and is of the foot of a bed made of what is known as Circassian walnut. The picture, if you will turn it lengthwise, reveals

strikingly the head and shoulders of a man, eyes closed and with a well-shaped, pointed beard. Perhaps you can see something else with it. At the same time the picture demonstrates the ability to get detail which is inherent in a Graflex. This picture was taken with a Graflex and K3 filter on a panchromatic film and was an interior time exposure.

* * *

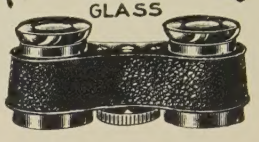
DeVry Still Camera users will be interested to know that a new Graf-DeVry 2" *f*:3.5 Anastigmat Lens, designed especially for the person desiring the more difficult and unusual pictures, has been added to the DeVry Line of motion and still picture equipment. The new *f*:3.4 lens is interchangeable with the standard lens furnished with the DeVry Still Camera. In addition to the lens' unusual speed it is equipped with a wide variety of stops and accurate focusing adjustments which aid the amateur in securing unusually fine pictures. The DeVry Still Camera is unique in that it shoots 40 pictures to a loading and uses standard 35 mm. motion picture film. Enlargements of any size may be made from

New Worlds in Nature revealed

By

MIRAKEL SPORT GLASS

Weight 6½ oz. Height 1½ in.



The glass for observing birds at close range

giving

Widest View Ever Attained

and

Clearness and Brilliance

$16.50

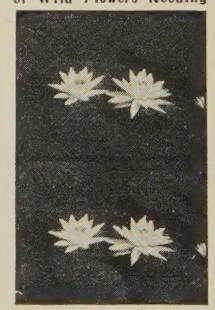
with natty leather case

The Pocket Glass for Every Use

MIRAKEL DISTRIBUTORS

1214 16th Street Washington, D. C.

36 BEAUTIFUL COLORED POST CARDS of Wild Flowers Needing Protection. 25c per doz.



11 Wild Flower Films

35 and 16 mm.

Rented $1.25 up.

Sold $7.50 up.

List on request

Colored Slides

of flowers, orchids and ferns with printed lectures rented $5.00 postpaid sold $60.00

58 Outline drawings of Flowers for coloring 12c per doz., 75c per 100

For other details write to

WILD FLOWER PRESERVATION SOCIETY

3740 Oliver St. Washington, D. C.

Used & New Field Glasses

Pocket size prisms in 3½, 4, 5, 6, 7 & 8 power, 3 to 12 oz. weight; $13 to $35. Zeiss, Hensoldt (including "Dialyt"), Mirakel, Busch, Schutz, Lemaire, Atco, Colmont and Megaphos, Galilean or "field glasses" $3 and upward. **Satisfaction guaranteed.** Sent on approval.

J. ALDEN LORING

Box K O-we-go, N. Y.

RECREATION MAPS

Embody entirely new principles, searching out and emphasizing recreational resources.

We are prepared to compile and publish small or large editions for national organizations, state or municipal departments, tourist bureaus, automobile associations, chambers of commerce, railroads, and hotels.

An interesting folder has been prepared which tells the complete story of RECREATION MAPS and their uses.

Write for your copy.

George S. Lee & Co., Inc., Rutherford, N. J.

the negatives which are twice the size of a motion picture frame.

* * *

Sound movies of the outdoors are made possible for users of the amateur 16 mm. film through the perfection by the Bell and Howell Company of the Project-O-Phone, a practical portable equipment for the recording and presentation of talking movies. This consists of three small units which can be easily carried from place to place and any Filmo projector can be adapted for use in this equipment. A standard 16-inch phonograph record of the 33⅓ revolutions per minute kind is perfectly synchronized with the projected pictures. Further details relative to this equipment may be obtained by addressing this department or the Bell and Howell Company.

* * *

Michigan is a State with a real State Department of Conservation that is doing a fine work in many directions. One of these is in making available for loan to schools and organizations motion picture films on the natural resources of the State. These films, which are made in the 16 and 35 mm. sizes, are loaned with no charge except the payment of transportation costs. There are reels on bird life, mammal life, fish and fisheries, forestry and other subjects. The films are handled by the Educational Division, Department of Conservation, Lansing, Michigan.

* * *

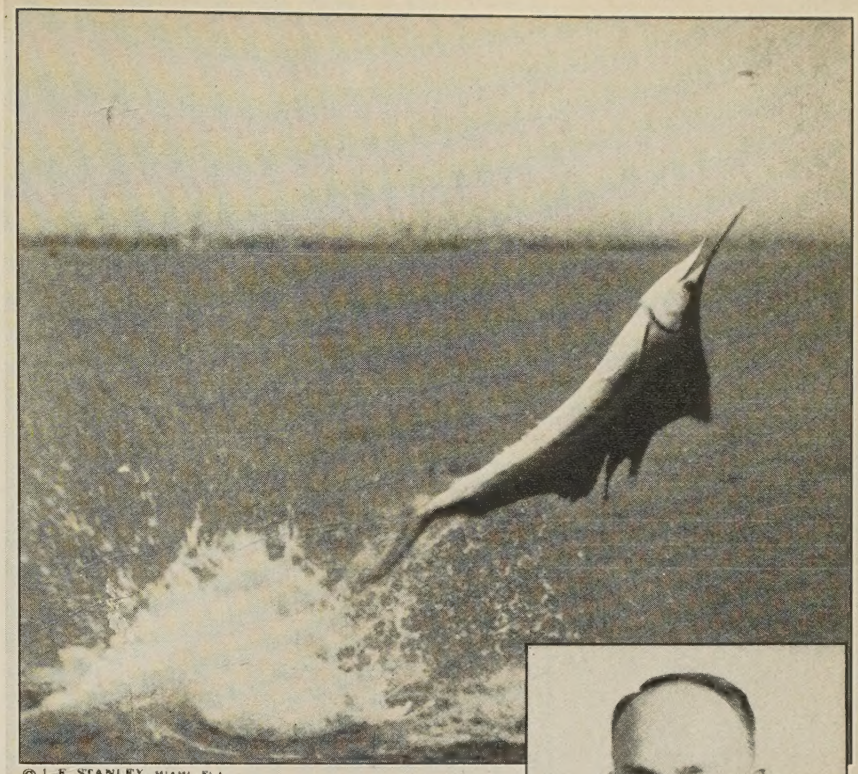
Also of interest in the field of educational films are a number of reels on biology and natural history brought out by the Carter Cinema Producing Corporation, 551 Fifth Avenue, New York City. The reels are available in both 16 and 35 mm. sizes at rental prices of $2.50 a reel. Space does not permit the reproduction here of the titles and description of the various films, but individuals and organizations interested in this excellent list may obtain it from the company at the address listed above.

* * *

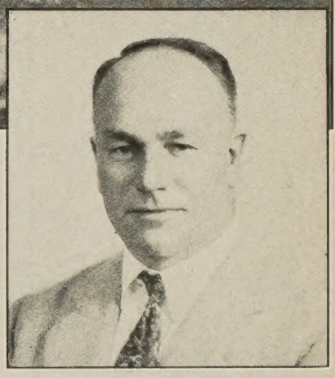
The troubles of the amateur movie enthusiast in keeping his films in the proper condition on the trail are solved by the Bell and Howell Company, who have recently issued a Filmador, combining the qualities of the thermos bottle and the humidor to give the right conditions of temperature and moisture to films placed inside it.

Different Maps

Something original and useful in road maps is being worked up by George S. Lee and Company of Rutherford, N. J., who are distributing "recreation maps," which give some indication of the natural beauties along highways. Instead of giving prominence to cities and towns in order of their population, and leaving gaps in the map between them, these new-type guides consider every feature in the order of its "recreational value." White Sulphur Springs and Charlevois appear in larger type than Milwaukee. Estes Park, Cumberland Falls and the sights along the Redwood Highway get more attention than New York and Kalamazoo. Early in the spring, the company will issue a book called "Vacation Tours," containing twelve two-week motor trips from New York City, and other maps are in course of preparation. They should find a ready market.



© J. E. STANLEY, MIAMI, FLA.



JAMES E. STANLEY

Ripping . . . slashing . . . leaping . . . seven feet of fighting sailfish can not elude the Graflex!

A picture of a lifetime! Few such pictures have *ever* been taken! For such an opportunity the *one* camera to have along is Graflex . . . the surest and simplest camera for anybody, amateur or professional to operate.

THIS famous sailfish picture has been reproduced in over 200 newspapers and magazines throughout the world, bringing inestimable publicity to the photographer and to the city of Miami, Florida. It was made by James E. Stanley of Miami, with a Graflex, after months of effort. Taken when the sky was dull and overcast—necessarily taken in a split second of extreme excitement — "what other camera in the world but a Graflex could possibly have done it?" says Mr. Stanley. "For Art, for Action—I never travel without my Graflex."

The big fish weighed 79 pounds, measured 7 feet, 8 inches in length, and took 38 minutes to land.

The CAMERA For More *Interesting* Pictures

GRAFLEX

FOLMER GRAFLEX CORP. . . . ROCHESTER, N.Y.

FOLMER GRAFLEX CORPORATION, ROCHESTER, N. Y.
I want to see the booklet that tells how more interesting pictures are being made.
Please send "Why a Graflex?" to name and address written on margin of this page.

NATURE MAGAZINE

PUBLISHED BY

THE AMERICAN NATURE ASSOCIATION

To Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

THE MAGAZINE

Editors

PERCIVAL S. RIDSDALE
Managing Editor

ARTHUR NEWTON PACK
Associate Editor

RICHARD W. WESTWOOD
Chief, Editorial Staff

R. BRUCE HORSFALL
Artist

EDWARD A. PREBLE
Consulting Naturalist

HARRY E. RADCLIFFE
Business Manager

PAUL F. HANNAH
Assistant Editor

GARNET W. JEX
Assistant Artist

TABLE OF CONTENTS

March, 1930

$3.00 a Year — 35c a copy

OUR OWLS IN FABLE AND FACT	*Edward A. Preble*	143
NATIONAL FLOWER VOTE		149
THE INDIAN RAIN QUAIL	*R. H. Ashby*	150
MARAUDERS OF THE FISH POOL	*Edna Betts Trask*	152
JASPER	*Paul F. Hannah*	153
THE FREE TRADER OF THE WEST	*Dan McCowan*	157
GOING, GOING, GONE	*Al Friedland*	158
WARS OF THE ROSES	*C. T. Gregory*	159
THE HUMBLE WAY OF THE SNAKE	*L. W. Brownell*	161
THE CROW CLARK FOUND	*F. W. Schmoe*	165
BAGGING THE BAGWORM	*Lena V. Feighner*	166
ROYALTY COMES TO AMERICA	*V. V. Wilcox*	167
TRACKS	*Russell Aiken*	170
THE BEETLE FAMILY	*C. F. Greves-Carpenter*	171
THE HEXENBESEN	*Leslie L. Haskin*	172
SPANISH MOSS	*G. H. Lentz*	173
INSECT HUNTER	*Alma Chesnut*	176
HAVE YOU SEEN AN OCCULTATION?	*Isabel M. Lewis*	179
THINGS TO THINK ABOUT		182
INDEX TO ADVERTISERS		204

THE ASSOCIATION

Officers

ARTHUR NEWTON PACK
Princeton, N. J., *President*

CHARLES LATHROP PACK
Lakewood, N. J., *Chairman Board of Directors*

PERCIVAL S. RIDSDALE
Washington, D. C., *Secy-Treas.*

RICHARD W. WESTWOOD
Washington, D. C., *Asst. Secy.*

HARRY E. RADCLIFFE
Washington, D. C., *Bus. Mgr.*

WILLIAM L. FINLEY
Jennings Lodge, Ore.
Director, Wild Life Conservation

DR. E. LAURENCE PALMER
Cornell University, New York
Director, Nature Education

RUSSELL T. EDWARDS
Washington, D. C.
Director, Educational Publicity

Scientific Consulting Board

DR. L. O. HOWARD
Principal Entomologist, U. S. Bur. of Entomology

DR. HARRY C. OBERHOLSER
Biologist, U. S. Biological Survey

HENRY O'MALLEY
U. S. Commissioner of Fisheries

C. W. GILMORE
Curator of Vertebrate Paleontology
U. S. National Museum

DR. WALDO L. SCHMITT
Curator of Marine Invertebrates
U. S. National Museum

VERNON BAILEY
Chief Field Naturalist
U. S. Biological Survey

DR. PAUL BARTSCH
Curator of Mollusks
U. S. National Museum

DR. EDGAR T. WHERRY
Wild Flower Preservation Society

DR. T. GILBERT PEARSON
Nat. Assoc. Audubon Societies

DR. WILLIAM M. MANN
Director, Nat. Zoological Park

Nature Magazine, past and present, is indexed in the Reader's Guide in your library.

NATURE MAGAZINE is published monthly by the American Nature Association
Entered as second-class matter May 31, 1927, at the post office at Washington, D.C.
Additional entry at Greenwich, Conn.

Subscribing Membership Blank will be found in the back pages of the magazine.

Publication and Editorial Office, 1214 16th Street, N. W., Washington, D. C. — Additional Offices of Publication, Greenwich, Conn.

A. B. MCCLANAHAN
Advertising Manager
ADVERTISING OFFICES
New York—Graybar Building — Washington, D. C.—1214 16th St.

Copyright, 1930, by American Nature Association

Title Registered U. S. Patent Office

THE BALD EAGLE, OUR EMBLEM

An Editorial

In all ages and among many nations the eagle has been considered the king of birds. In ancient mythology he was held sacred to Jove, who had dominion over the seasons and held in his grasp the lightning. In early historic times many nations paid it special reverence, and the Romans, following the earlier example of the Persians or Assyrians, made it their ensign. More modern countries—France, Prussia, Italy, Mexico, have chosen its figure to adorn their standards. It was natural, therefore, that America should adopt its own fine species as its emblem. Since 1782, when it was formally chosen, the eagle has been selected to appear on the official flags of Illinois, Iowa, Kentucky, Michigan, New York, North Dakota, Oregon and Utah. His image also figures on various flags, standards and seals of the United States, of the Army and Navy, and of the President and his Cabinet, and on several of our coins.

The bald eagle is found in all our states and in Alaska, and may, therefore, come within the ken of every citizen. There exists in Nature scarcely a sight more inspiring than such a bird soaring in majesty over mountain crag or towering forest. And as a country needs qualities other than weakness, so it was fitting that we chose for an emblem a bird whose qualities include strength, courage and hardihood.

But how have we treated our emblem? Though it is true that in about thirty-one of our states, those that have adopted the "Audubon Bird Law", the eagle is protected by inference, and in a few others it is specifically protected, the remaining states either have no laws in its favor, or place it on the list of unprotected birds. And it is rare that a killer of our eagle is punished in any manner.

Since in most of our states the advance of settlement has naturally reduced the range suitable for its continued habitation, in parts of Alaska only can the eagle now be counted abundant. Yet this territory has voluntarily chosen to bear the ignominy of putting a price on its head. Other countries may have failed to protect the creatures chosen to adorn their standards, but we believe that ours is the first to allow a bounty for killing the bird formally selected as its emblem.

In 1917 the legislature of Alaska, on the plea that the diminishing supply of fish and game was due in part to the eagle, passed a law placing a bounty on the bird. This law is still in force and the feet of upwards of fifty thousand of the birds have been redeemed, some for twenty-five cents each.

But after a century and a half of indifference to the fate of its emblem, we note that the Congress of the United States is considering a bill to make the killing of the American Eagle anywhere within the territorial limits of the United States a federal offense. This bill is said to be sponsored by the National Association of Audubon Societies, and the National Committee on Wild Life Legislation. While gratified that our Government has at last taken steps to protect this bird, we believe that the proposed bill is deficient in many respects, and especially in the lack of an appropriation. But a beginning has been made and we hope that it will lead to more adequate protection for this vanishing species.

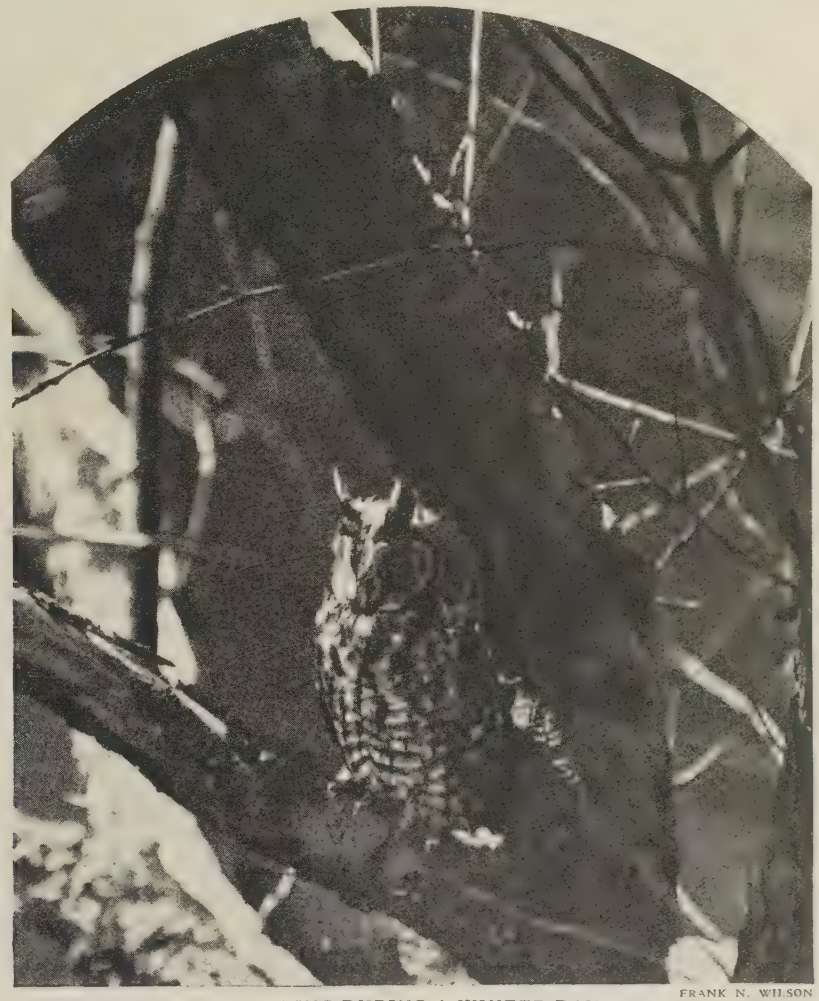
The destruction of certain birds and animals, on the plea that they are inimical to game birds or animals, or to other interests, but whose preservation from many points of view is desirable, is becoming much too common. Let us be more charitable toward the more interesting of our predatory birds and animals. At least let us refrain from killing our national bird for fifty cents or a dollar. If a few eagles have been standing in the way of Alaska's prosperity may we not hope that, with twelve years of destruction, the crisis has passed. Let us hold our national emblem not only on our banners and coins, but in our hearts.

. . . WHETHER BY STARLIGHT OR MOONBEAM, THE LITTLE SCREECH OWL IS EVER ALERT FOR MOUSE OF FIELD OR WOOD

NATURE MAGAZINE

Volume 15
Number 3

March 1930



FRANK N. WILSON

NAPPING DURING A WINTER DAY

The long-eared owl is one of the most beautiful and useful of our species

OUR OWLS in FABLE and FACT

The Romantic History of a Much Persecuted Race

by Edward A. Preble

WHEN the southern mountaineer puts a fire shovel in the rosy embers, that its gathered heat may burn the toes of the shivering screech owl and prevent it from working its direful magic on his household, he is but responding to the remnant of a belief or superstition that has come down to us from antiquity. The white woodsman, whether he knows it or not, reweaves in his superstition the slender but tenacious threads of half-whispered legends of early European culture; his black companion from Africa may well have brought this half-believed dread of the bird of the night from that land whose unlettered past perhaps holds concealed as much of myth and mystery as the better chronicled lore of Greece and Rome.

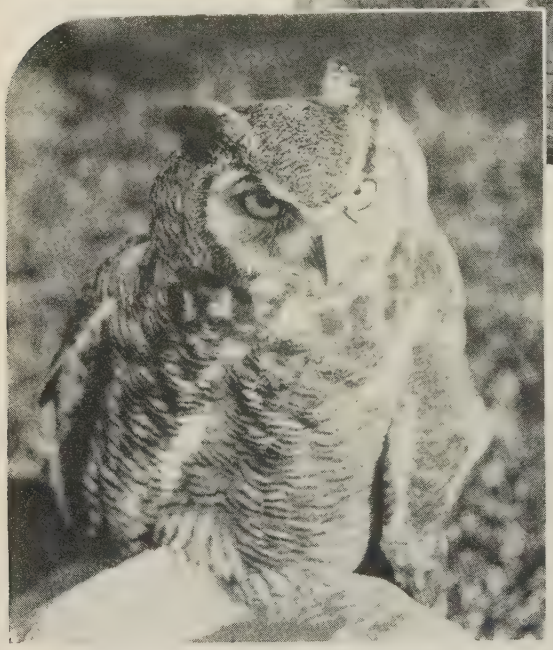
Many ancient peoples have woven the birds and beasts about them closely into the warp and woof of their religious beliefs or folklore, and, with the keenness of observation of those who live close to Nature, have made ample use of the mental and physical characteristics of their companions of the wild. Naturally to the

POSING AT A FENCE CORNER

These young great horned owls would welcome a few mice—wood, field, or house

THE MOST POWERFUL OF ALL

Though outlawed in most sections, the great horned owl is more friend than foe



J. C. ALLEN

owl has fallen a generous share of such lore. Owls are birds of the night more often heard than seen, and in the minds of the uneducated and superstitious are often creatures to be dreaded because endowed with unusual powers. Always the poets and romancers have been quick to seize upon these fancies, and therefore we find the owl playing important rôles in annals of the dark and mysterious, and often in evil company.

In ancient Grecian mythology the owl was sacred to Minerva or Pallas Athene, the goddess of wisdom and the useful arts, and this fact and the natural respect that seems owing to a bird that is prone to assume an attitude and mien suggestive of deep thought, and still says little or nothing, have kept alive in the minds of many the concept of the owl as a bird of wisdom. Also he can see in the dark and therefore must know many things that are hidden from creatures less well endowed. The fancied connection of the owl with the fortunes of certain characters of the ancient mythologies, and the attributes ascribed by the ancients to the bird, are curiously reflected in the scientific names that have been applied to various species.

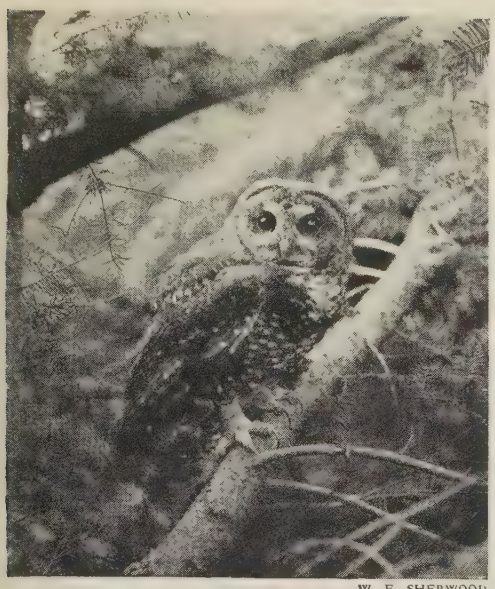
The Romans of old viewed the owl with distrust and even dread. They considered it as a messenger of death, and we read that the debates of state were sorely interrupted whenever an owl obtruded its presence on the neighborhood. Owls, indeed, prophesied the deaths of several Roman rulers. The modern Romans, however, seem to have lost this fear, and with it much of their respect for the owl, and indeed for bird life of any kind, and now use tethered owls as lures to entice into their snares the innocent small-bird migrants on their way to other lands.

Perhaps because of the owl's natural prowess, we find that in early historic times his image was worshipped as a war god by the Esthonians on the Baltic, and this circumstance may very possibly be an echo of earlier ideas widely prevalent among some of the ancient tribes of the region that we now call Europe. The old Hebrews must have had in mind that the owl was a favorite of the heathen gods (if we presume no error in translating), when they classed it with those birds which were unclean and must not be eaten. Parts of the owl are proper ingredients of witches' brew, according to the poets, and of certain remedies for disease, if we may believe the pharmacists of former days. To some the cry of an owl augured ill for the new-born infant, and even if evil should be fended off on that occasion, yet it failed not to pursue the child as it grew older.

Some ancient peoples believed that the owl sucked the blood of helpless babies, and even the wise Pennant, who was usually quick to detect and discard the improbable, quotes Ovid to this effect, and seems inclined to credit the fable. As a purveyor of bad news, with its apparent eagerness to deliver its message when it haunts the rafters of the fated house, the observant Chaucer thus refers to the night bird:

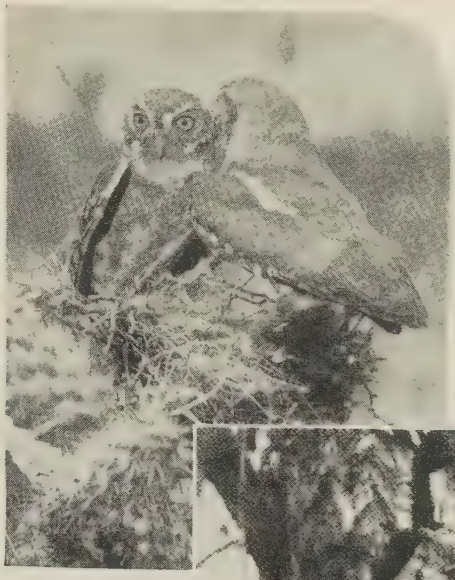
"The oule at nyght aboute the balkes wonde,
That prophete is of woo and of myschaunce."

As a nocturnal bird, heard in the depths of woods and other places where loneliness prevails, the owl has been considered in many lands to be connected with death either in the role of prophet or herald. Watchers with the sick hear the cry of an owl, sometimes startling, sometimes indicating depths of sadness, as if the singer had some unforgettable sorrow and must needs share it with the world. Such a voice naturally bears a foreboding message to the minds of those who fear that death



W. E. SHERWOOD

THE SPOTTED OWL OF THE WEST
A frequent dweller in caves



A PAIR OF ELF OWLS
Birds of the giant cactus

THE SCREECH OWL AT HIS HOME
A fine example of protective coloration and pattern

R. B. ROCKWELL

may be hovering near. The Spanish have a legend that before the death of Christ the owl was a sweet singer, but that in memory of that time he now shuns the day and has but a harsh voice. In some countries it is the larger owls that bear sinister reputations, while the smaller species may be regarded as harmless or even be accorded a measure of affection as the friends of man. Both Shakespeare and Chaucer (as we have seen) refer to owls as harbingers of death or lesser woe, and perhaps have helped to bring to us from ancient times those vague beliefs of the owl's relation to trouble that some of us still cherish.

The written word, however, can not explain why many peoples in distant lands have credited the owl with aiding in the task of guiding the souls of men to Paradise. Students of mythology have traced the owl as an agent in this errand among the beliefs of the ancient Tuscans, and it is very interesting to find among some of our own native California tribes the belief that the ghosts of the dead become owls, and journey away on the path of the wind, and may even return and do injury to their former associates. Among the eastern Cherokees, also, owls are embodied spirits, and their cries are dreaded. But the birds' real powers are turned to good account, for if the eyes of a child be bathed in water made potent by soaking the flight feathers of an owl, he will always have the power to keep awake at night. But lest this power be too easily acquired and thus lose its virtue, it is prescribed that the feather must be one found by chance, and not by special search.

Another interesting though unrelated legend is found among the Eskimos, who explain the creation of the owl by the story of a maiden who, as a punishment for some wrong committed, was changed by the displeased god to a bird. In her terror she dashed blindly about until, from striking in her heedless flight against an icy wall, her beak was bent into a hook and her face flattened. Ever since then owls have been birds of the night, seeking to hide their ill-formed faces from the eyes of other birds, and voicing their grief and remorse. Others among our native peoples viewed the owl in various lights—some used its stuffed form as a sort of charm; some kept the bird as a pet; some employed its feathers in their special ceremonies; some invoked its aid to frighten obstinate children into obedience.

As a haunter of woods and caves, it was natural that the owl should take possession of towers and steeples, and especially deserted ones. By the Syrians it is called the "Mother of Ruins," and the poet, as Gray in his "Elegy," delights to people the abandoned works of man with owls, when night has stilled Nature's voices:

"Save that from yonder ivy-mantled tower,
The moping owl doth to the moon complain
Of such as, wandering near her secret bower,
Molest her ancient solitary reign."

Owls were formerly considered to be closely related to the hawks, but modern systematists are inclined to place them near that other group of soft-feathered night-flyers, most commonly represented in America by the nighthawk and the whippoorwill. In their food-habits, however, they greatly resemble the hawks whose labors they supplement, carrying on by night the task of keeping in bounds the hordes of mice and rats that without such checks must long ago have overrun the earth. In this office they are greatly aided by their soft plumage, since it helps to make their flight noiseless. If one examines the flight feathers of an owl, the reason for this silence is evident, for the tiny barbules are furnished

H. AND E. PITTMAN

NEST OF LONG-EARED OWL

In a twiggy home, often the abandoned residence of crow or hawk, these owls brood their eggs

O. J. MURIE

each with the softest of fringes, through which the beaten air passes without the rushing sound that accompanies the rapid flight of the hawk or eagle.

The good offices of owls have been so long known that it is a matter of wonder that it should be necessary to reiterate the facts. For hundreds of years, in various parts of Europe, small owls have been tamed or kept in gardens on account of their prowess as mouse catchers. It is a sad commentary on our intelligence that we have retained as a part of our heritage the superstition and savagery of our ancestors, rather than this useful knowledge, at the same time with unconscious irony excusing the persecution on economic grounds. To many persons owls are considered as pests, to be destroyed on sight. The farmer, occasionally losing a fowl that the great horned owl has picked from its unprotected perch in the orchard tree, forgets the good deeds conferred by the bird in other ways, and condemns the whole class of owls. If a game bird is found to figure in its menu, excuse is afforded for the wanton destruction of any of the tribe that are encountered.

Sixteen distinct species of owls inhabit North America, with several additional geographic forms. The great horned owl, *Bubo virginianus,* is widespread, ranging from the tropical forests to the limit of tree growth in the north. Scarcely inferior in size to the famed eagle owl of Europe, it is considered to be our most powerful species. In the far north, its usual prey is the varying hare, and it thus aids the lynx and other furred predators in reducing the legions that without these checks, and periodic diseases, must long ago have devastated our continent. In many a rough western canyon the demands of a brood of downy great horned owls, snug in their nursery on cliff or ancient tree, furnish the urge that results in the death of dozens of pocket gophers or ground squirrels that are the foes of the rancher.

The ordinary note is a deep-toned hoot, *Too whoo-whoo, whoo, whoo;* this has many variations. More rarely is heard a terrifying shriek, considered by some to be the hunting call, though usually, like the good hunter he is, the bird is silent when seeking prey. Those who find inspiration in the sounds of Nature will find it easy to forgive this fierce bird his occasional meal of grouse or barnyard fowl in return for the opportunity to hear his deep mysterious hooting in the lonely glen, or see him take his watchful perch on some favorite lookout tree in the gathering dusk.

In North America our owl of the church tower is most likely to be the barn owl, a close relative of the barn owl of Europe and called by the ornithologists *Tyto alba pratincola.* This is the monkey-faced owl of the newspapers, often credited with such rarity that its fortunate captor hopes to realize a small fortune from the first museum he reaches. As a matter of fact most collections are already supplied with specimens, and the curator would rather see the owl alive than dead. If one who feels tempted to kill him could examine a few of the pellets that he ejects after each meal, and note the bones of rats and mice that form such an eloquent index to the bird's good offices, he could scarcely bring himself to destroy so friendly an ally. But good news travels slowly, and the thoughtless and ignorant are helping to bring the day when this beautiful species may actually be as rare as the uninformed now believe the "monkey-faced owl" to be.

SNOWY OWL AND HER YOUNG

Thus she guards her eggs; later the fluffy chicklets greet the world

O. J. MURIE

The beautiful snowy or arctic owl, *Nyctea nyctea,* of circumpolor range, is another friend who suffers unduly at the hands of man. It is a bird of the northern wastes, where it lays its eggs on any little hillock that commands a view of the turfy plain. While the parents are raising their hungry brood the hordes of lemmings and of shorebirds render tribute to the keen-eyed hunters. Then comes the long winter when most of the inhabitants of that bleak land forsake it, and famine threatens the few carnivores that remain. Then the white owls must move south into the wooded country, where they claim a share of the myriad hares. If these fail also, they must go still farther, and so it happens every few

years that an invasion of snowy owls occurs in our northern states. The great birds are then the mark of every thoughtless gunner, and few of them live to return. Fortunately the diet of the visitors has been investigated by their friends, and the alien rat, whose ravages cost us millions of dollars annually, turns out to be such a frequent victim that the occasional fowl or game bird that is taken should not blind us to the value of the owl. So let us spare these rare visitors from Arctic lands, guests for a cold season.

This is by far the most significant popular article on owls that has ever come to our attention and ranks with Mr. Preble's previous articles on our hawks and on our fur-bearing animals. Mr. Preble's writings are always the product of careful research and thought backed by a lifetime devoted to Nature and the outdoors. When he writes on our wild life he does so with an intimate knowledge of his subject as it is found in its native habitat in woods or field.

One of the handsomest of our owls, but one that unfortunately is less often seen than formerly, is the long-eared owl, *Asio wilsonianus*. He is of medium size, and his extremely long ear-tufts are characteristic. The older ornithologists tell us of often finding several pairs nesting in such proximity that a colony was suggested, but most of us are fortunate if we find one nest. This is usually the abandoned home of a crow or other large bird, and may hold a half-dozen or even more of eggs or young. Yet in spite of its large families this is one of the owls that have suffered much from our unreasoning craze for killing. Its food consists largely of mice and other small mammals, though many insects are taken, and some birds, spiders, crayfish, small snakes, frogs, snails, and even earthworms have also been found in their stomachs. Forbush tells of one that had eaten a screech owl and in turn had fallen victim to a barred owl. The long-eared owl utters a clear scream, sometimes two-syllabled, and at times a rattling, rather musical, call; a variety of other sounds have been recorded.

The short-eared owl, *Asio accipitrinus*, is so called from its tiny almost hidden ear tufts. It is found throughout the northern hemisphere, and as is proper for a bird that lives so much in perpetual day, it is one of the most nearly diurnal of our species. Another peculiarity which may be attributable to its ranging so widely in northern lands is its habit of nesting on the ground, where it raises a large family. Few examples of bird courtship are more interesting than the aerial antics of the male short-eared owl, as he swoops about high in air, uttering a variety of peculiar notes, and clapping his long wings together. This performance may take place during the day, especially if clouds be present. In its food habits this owl is generally beneficial. The great bulk of its diet consists of mice and instances are on record of its materially assisting in the suppression of mouse plagues. Some birds are also taken, and many insects, including locusts.

PREPARED FOR ANYTHING

Though he recognizes his friends, this young horned owl resents the intrusion of strangers

The barred owl, *Strix varia*, is perhaps the commonest of our larger species. Its distribution covers most of eastern and middle North America. Though found in our northern forests, it is in the swamps of the south that one most frequently meets the bird, usually by way of its voice, which in mocking tones seems to ask the traveler "*Who cooks for you; who cooks for you-all?*" This call is frequently heard in the daytime, especially if the sky be overcast. In the mating season a variety of other ludicrous cries are uttered. The distinguishing characters of the bird are large size, untufted head, and black eyes. Early in spring the owl seeks some hollow in a large tree, or perhaps an open nest deserted by crow or hawk. The eggs rarely number more than three, and like those of all owls, are white and rounded. The food habits of this bird entitle it to our protection for it seldom catches poultry or those creatures that man considers game. Mice and other small mammals are most commonly its food. In a number of cases other smaller owls have been eaten. When taken young this owl makes a very interesting pet, and several amusing accounts have been written by bird enthusiasts who have become possessors of a nestling and have raised it to maturity. Though usually a bird of the lonely mountain forest or the deep swamp, the barred owl sometimes makes its home in woods close to cities, and even in cemeteries. Sometimes the sparrows or starlings, or the house rats, man's unwelcome guests, are the attraction that leads them to brave the dangers of such surroundings.

In our states west of the Rocky Mountains, from Washington southward, and also in Mexico, is found the spotted owl, *Strix occidentalis*, with several races. It is most closely related to the barred owl of the east, but is smaller in size, and necessarily differs considerably in its habits. It has been most closely studied in our southwestern states, where it nests on cliffs or in shallow caves in wooded canyons, or more rarely in the "witch growths" that appear on coniferous trees. Its repertoire is considerable, usually consisting of different combinations

of a musical cooing note. The nesting time is spring and two or three eggs usually comprise a set. The food, as far as known, consists almost entirely of wood rats and other rodents. Captive individuals have persistently refused to accept the flesh of birds, both wild and domesticated, and were just as consistent in their eagerness to take at any time chipmunks, ground squirrels, and mice, as well as domestic rats.

The great gray owl, *Scotiaptex nebulosa,* is the largest though not the heaviest of our owls. Some of the native tribes in its range, which covers most of the great northern coniferous forest, pay it the highest possible tribute when they call it the real, or Indian, owl. Though longer in body, and broader of wing, the bird is inferior in strength and in size of body to both the snowy and the great horned. Still it has no difficulty in disposing of the northern hare, which constitutes its principal food. Like all owls of the far north this species often hunts by day, and its eyes are small when compared with those of its relatives. Its large size and rather uniform grayish plumage, which is remarkably soft and loose, will serve to distinguish it from any other species. Its eggs are the largest laid by any of our owls, and the nest is an open one usually high up in a conifer.

One of the relatively common small owls of the great transcontinental forest, but one which rarely comes into the United States, was happily named after the great naturalist who did so much for northern zoology—*Cryptoglaux funerea richardsoni.* In its chosen haunts of spruce and pine it is often heard in the long spring twilight serenading its mate, its musical notes betraying its relationship to our own more common friend, the saw-whet, but greatly exceeding that bird's efforts in variety and sweetness. In the deserted hole of a flicker or in a similar cavity, it rears the darker plumaged young. To the Nature loving camper in northern lands the experience of visiting with Richardson's owl is a treat worth a long journey, and one calculated to provoke the wish that this little haunter of the silences were more abundant and had a wider range.

The smallest owl of the north is *Cryptoglaux acadica,* generally called from its note the saw-whet owl. The ordinary note is a whistle, repeated at intervals of about three seconds, perhaps for several minutes at a time, that has such a scraping, metallic quality that one readily notes its resemblance to the sound made by filing a large saw, though few would actually be deceived by the note. Unless one follows up the source of this elusive sound, a notable feature of our northern spring, and actually detects the little singer on his perch, even the confirmed bird-lover may live for years in the haunts of this little night wanderer without knowing of his presence. Near the close of an April day, when the freshness of the newly-bared earth, eager to spring into greenness, sends out those delightful odors that seem intensified by the coolness that grows with the declining sun, the little saw-whet pours forth that series of love-notes whose strange quality has made them a commonplace in the written word, though not in every one's experience. We warrant that few will ever forget their first meeting with this dainty little bird.

Following the courtship that this love strain presages, the little owls set up housekeeping in a tree hollow, usually the deserted hole of a flicker, and there raise the darker-plumaged young ones that differ so much from their parents in appearance that they were long supposed to represent a different species.

The little screech owl, *Otus asio,* is probably our commonest species and yet how little we know about him. Probably he was named because of his fancied resemblance to some European species, and the name sticks to him, though few have heard him screech. The books say his note is a "quavering call," or perhaps that he is misnamed, because he does not screech. Yet he screeches in the forest, if not in the books. To some earnest student, keen of hearing and apt at describing what he hears, there is no more fertile field for research than the study of the notes of our owls, and none of them, I believe, is more versatile than our little tufted friend. Hundreds of times has the voice of this night-hunter come to me from the forest depths, yet I must confess that I had heard screech owls for years before I heard one scream. Many times, however, usually in the stillness that comes after midnight, have I heard a series of musical screams, sometimes slightly tremulous, and occasionally terminating with a rasping squeal. Sometimes the squealing or screeching may take on a querulous quality, and there may be either a rising or falling inflection at its close. On a few occasions the screech has been actually startling, and for a moment I have doubted its source, but always, if I listened intently, there would come a hint at least of the usual quavering call that is so characteristic, and that in most accounts of the bird is the only note mentioned.

Thoreau found only dolefulness in the voice of this little owl and so the notes have impressed many observers, but to me his quaver is a cheerful sound. After all, it is no concern of ours, for he is calling to his mate, and there exists no evidence that for her it carries anything but sweetness. But our singer does not appeal to us by voice alone for he is one of the night watchmen who guard our property. Most of his food consists of the mice that ravage our fields. Sometimes, it is true, the demands of the nestlings may drive the parents to take toll of their lesser feathered neighbors. But I have a friend living in a community that boasts one of the densest small bird populations in the country, whose yard has held for many years a pair of nesting screech owls, and where vireos and thrushes and sparrows rear their broods in peace.

In most parts of the country this owl appears in two color-phases, red and gray, and even in an intermediate hue. The nest is in a hollow tree, and the newly-hatched young are pure white, and closely resemble young chickens.

The flammulated screech owl, *Otus flammeolus,* is a bird of the highlands of Mexico and Central America, and in our western states is a rather uncommon resident north to southern British Columbia. It is smaller than the common screech owl, and like it, is found in both the

(*Continued on page 188*)

Wild Rose Wins

Sweeping Victory Is Gained over Columbine

E. L. CRANDALL

THE CHOICE OF THE PEOPLE

In a nation-wide election which spread over thirteen months, this flower decisively defeated a select field

THE wild rose is the national flower. So the citizens of the United States have voted in the American Nature Association campaign which ended December 31, 1929.

Rolling up a total of 492,811 votes out of the 1,067,676 votes cast, it gained a plurality of more than 230,000 votes over the columbine, the nearest contender. It captured every state except Colorado, Florida, Illinois, Minnesota, Massachusetts, Vermont and Washington. With practically no "campaign committee" in any state, and with a number of organizations actively trying to defeat it, it withstood every assault upon the lead gained early in the campaign.

The columbine, supported vigorously by the newly organized Columbine Society during the last days of the referendum, had 261,451 backers, who threatened, during early December, to sweep the rose under with a flood of votes. When the contest closed, however, the leader was still gaining.

How decisive was the choice of the people is indicated by the standing of the seven other leading candidates, shown in the table on page 184. More than 65 percent of the vote was divided between the two leaders and there is no question of these being the national favorites. The violet, goldenrod, American Beauty rose, phlox, daisy, dogwood and mountain laurel, which finished in the order listed, never had a chance of victory. All other flowers, grouped under "scattering," received but three and one-half percent of the total.

The wishes of the people will be translated into legislative form—Congress willing—as soon as possible. It is understood that a bill for the columbine is likewise to be introduced by the Columbine Society.

The National Flower Campaign was begun late in 1928, first to engender an interest and love for wild flowers; secondly, to promote their conservation, and thirdly, to direct attention to Nature generally. The Association had no candidate. It likewise felt that though a National Flower should be chosen, its choice was secondary to the other interests involved.

The referendum has been eminently successful. A large proportion of school children voted, along lines suggested by the Association, in such a manner that there is no question of the benefit they derived. A typical campaign is the one conducted by the Franklin Junior High School of Green Bay, Wisconsin, where all the state flowers and candidates were illustrated on the school bulletin board, and discussion preceded the actual voting by a month.

Educators, who assisted the voting in more than a dozen states, have asserted that the campaign has fostered citizenship, by giving the school children opportunity to vote in a National event. It also created knowledge of history and Nature, both of which had to be studied to arrive at an intelligent opinion.

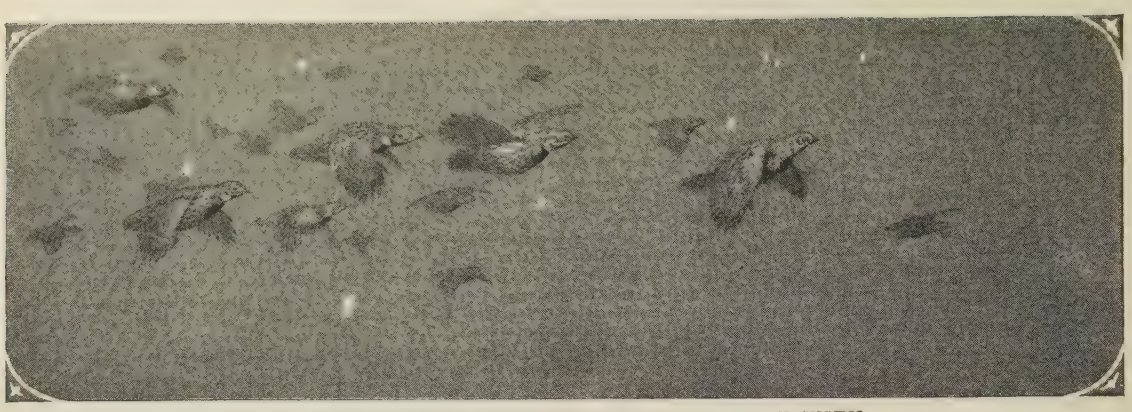
E. L. CRANDALL

THE COLUMBINE WAS RUNNER-UP

While it did not run a close race with the rose, it was far ahead of the violet and golden-rod, third and fourth place winners

While the tracing of adult education is much more difficult, the Association feels confident that the interest expressed through the votes was not merely for the moment. In more than thirty commonwealths, state-wide campaigns were conducted by local organizations. The Garden Club of America, the Daughters of the American Revolution, the General Federation of Women's Clubs, the State and National organizations of Camp Fire Girls and Girl Scouts, the Columbine Society, Nature Clubs and conservation groups scattered over the entire nation all took a signif-

(*Continued on page 184*)



"A TINY RAIN-QUAIL WINGED HIS HAPPY WAY WITH A GREAT HOST OF HIS FEATHERED FRIENDS"

The Last Fight *of the* Indian Rain-Quail

by R. H. Ashby

Illustrated by R. Bruce Horsfall

There was no wind. The palm trees stood up straight and tall and stiffly under a sky of cloudless blue. Through the close-matted foliage of overhanging peepul trees sunlight filtered, splashing the smoke-stained walls of Keonta village nestling in the shade.

Soft, twittering voices of women gossiping in the open, the tinkling bangles of girls at the well, the cooing of doves on the housetops, the chime of a distant temple bell mingled soothingly in a peaceful quietude.

Only in the house of Taj Khan, the headman of the village, was there consternation. Here, as befitting his dignity, he sat on a wooden platform, while a crowd of excited villagers squatted around on mats in all eagerness to witness the day's match between the village champion rain-quail, and a stranger bird belonging to Karim, the crafty money-lender from the great city across the plains. It was to be a crucial, even an epochal battle.

THE YELLOW FIGHTING CLOTH WAS SPREAD: A FEW GRAINS SPRINKLED IN THE RING

"Kana", the pride of the village, was just a common little, black-breasted, bob-tailed rain-quail of no special breeding, rather resembling a dwarfed half-sized partridge. A year since, while feeding in the low-lying millet fields on the outskirts of the village, he had fallen into the cunningly-laid trap of the bird-snarer. There had been a vain struggle within the net and then he had been rudely thrust into a net-covered basket where to his astonishment he had found himself with a number of his feathered friends—prisoners.

That day he had been taken to the dusty and noisy bazaar and offered for sale and bought by Taj Khan for a few annas, in the hope that he would turn out well. Nobly had the quaint-looking fellow justified his purchaser's expectations, and rigorous had been his training in the hands of Taj Khan, who was well versed in the ancient secret practices of the quail fanciers, handed down since the days of the Moghul rulers of Delhi in training birds for their beloved sport. Much had the little rain-quail suffered in his period of preparation for this fight with the money-lender's bird.

According to immemorial custom, India through, he had been dieted strictly on molasses and spice pills, together with a small ration of grain. Tonics made of astringent herbs, mixed to form a lotion, were freely rubbed all over him to harden his flesh, while a special rage-developing treatment was inflicted to make him fight with a will.

This particular portion of his daily drill being considered in India as essential to the prize-fighting rain-

quail as sparring is to the boxing pugilist of the western world, took the form of constant teasing whenever the hungry bird was given his grain.

Taj Khan would put the millet in his left hand, offer it to "Kana" at a distance, but upon the tame little fellow advancing in eagerness to feed, his right hand, swathed in protecting cloth, would be brought down upon the grain time after time, until by constant teasing "Kana" would lose his temper and rush at the obstructing hand, pecking and fighting furiously till exhausted. Then when he could fight no more, he was allowed to eat the well-won prize in peace.

"Kana" soon realized that the only way to get the grain was to attack it. So whenever anything, bird or hand, thereafter interposed itself between the rain-quail and his grain, there was a fight.

Under a period of this treatment, "Kana" improved rapidly and in a short time had met and vanquished all the local feathered fighters to the entire satisfaction of Taj Khan, who, confident of his bird's prowess, had arranged this match and moreover had laid wagers with those of his confreres who wished for the added thrill of a gamble.

"... CAME DOWN THE STROKE OF HIS TERRIFIC BEAK ON HIS OPPONENT'S HEAD"

The gray-bearded money-lender and his friends had also backed their bird heavily and smiled with the contempt of city folk at the excited babbling of the village worthies. They, too, had their secret ways of schooling quails for the fight,—methods, they considered, that would beat those of rustic simpletons and village cultivators.

At last all was ready, the bets were arranged and the village patriarch, in his capacity of referee, spread the yellow fighting cloth on the ground; sprinkling a few seeds of grain in the centre of the ring he paused impressively for a few seconds and then gave the word to commence. The birds were shaken from their cloth bags in which they had been confined, and placed at opposite ends of the cloth.

They had been left without food the previous day and in their hunger they both darted at the grain only to meet the maddening obstacle which their rage-inducing treatment had made them so familiar with.

For a few seconds the combatants halted, stiffened themselves and glared at each other. Then "Kana" drew himself up to his full height and advanced a step majestically, his round, red, malicious eyes fixed upon his foe, his black breast expanding with indignation at the stranger's presumption, his short, rounded wings quivering, his stumpy little russet tail spread, his smooth head bobbing with extreme alertness, on the lookout for the very least movement of his enemy.

Suddenly there was a rush, they met in mid-air like fighting cocks. Feathers flew. Both being birds of proved ability, the match was expected to last at least thirty minutes, before the fighters acknowledged defeat in the regulation quail manner by turning tail and flying off the cloth.

"Kana", quick as a flash of light, sprang at the other breast. Just as quickly, indeed, came down the stroke of his terrific beak on his opponent's head, then before the blow could be repeated he seemed to falter and retreat wildly before the stranger's pursuit. Urged on by the astonished Taj Khan's oaths, "Kana" rushed once again at his enemy, but again gave way almost before he touched him. He seemed to be afraid.

Panic prevailed, the crowd jeered and groaned, the money-lender looked on and smiled, while "Kana" dodged uncertainly about the arena, and in a disgracingly short time acknowledged defeat by flying away over the spectators' heads and alighting some distance down the road.

The noise was deafening. Taj Khan almost foamed with rage, and in his fury of disappointment lifted a brick and hurled it at the vanquished warrior, then with a scowl turned to argue his debts before venturing to catch his bird and push it back into its bag.

After being recaptured "Kana" would not be permitted to fight again; indeed, he would be fattened for the cooking-pot. No chances would be given him for he had learnt the sweets of laziness and would in all probability always retreat rather than fight in future.

"Kana" was ignorant of his fate, nor did he much resent the stone that Taj Khan threw. For the tiny bird was at the moment suffering torture caused by the finely-powdered chilli seed which had blown into his eyes and mouth at the first blow he had given his opponent.

Practicing an ancient cheating ruse sometimes used by scoundrels among the Oriental bird training fraternity, the money-lender had sprinkled his bird's feathers with chilli powder in such a manner that it would not inconvenience his own quail but incapacitate his opponent. This dastardly trick had worked and lost "Kana" the fight, but it had an unlooked-for result now. Dazed with pain and thirst which were intensified by the sun's glare, the poor bird crept miserably aside into the shelter of some bushes by the side of the road. He lay still for a while in his place of concealment, while Nature exerted all her efforts to slowly unravel in the coils of his brains the memory of safe resting places and secluded feeding grounds in the vicinity of a pool a mile distant.

After a while he emerged from his hiding place and made a few short, rapid quail flights in the direction of a group of mango trees, alighting in the thick grass

and rushes fringing the cool and shaded water-side.

Here he lay so still among the undergrowth, his protective coloring camouflaging with the surroundings so like the dried weeds and the mud, that even the gambling field-mice did not discover him until they tumbled against what they mistook for a clod of sun-baked mud, and a pair of horned owls crooned in a branch above without noticing him, their gentle murmurings soothing his weary senses after the hubbub of the village and the shouts of the villagers. After a while he ventured cautiously down to the water's edge and relieved his burning eyes and throat of the remaining chilli powder. Then he returned to the grateful shelter of the reeds and feasted on the myriads of luscious grubs and caterpillars he found there, taking a keen interest meanwhile in the teeming bird life about him.

Just before night fell a great regiment of bar-headed geese lead by a wise old gander in its V-shaped array passed straight overhead on one of those mysterious journeys towards the setting sun, which shone red as a ball of live coal through the rain-filled clouds. Night fell swiftly, for in India there is but little twilight, and when the first croaking of the bull frogs caught his ear, he rose from his covert, listened awhile to the faint sleepy quacking of the teal and the splashing of water off webbed feet; then, finding all was safe, he revelled in all the night doings of a free, wild quail once more, for being nocturnal birds, quails live their days when all is dark to man.

First he indulged in a sand bath; then he attended to his toilet, spending a considerable time preening his plumage until the feathers of his wings and tail were arranged to his complete satisfaction.

Presently, however, he grew restless. He felt a strange desire down in his heart for companionship. He stood erect, gazing up at the soft sky overhead as if expecting some summons, when his ear caught the sound of many tiny wings overhead, a sound that stirred some dormant memory and set his very soul quivering with a strange desire to join the passing birds.

As he was gathering himself for flight, they abruptly swooped, and in an instant the water-side all about him was thick with rain-quails alighted there for a brief rest on their monsoon migration from the low-lying districts to the drier parts of the United Provinces.

That night, the grey beards of the village gathered under the peepul tree, the hookah was passed around and under the influence of smoke Taj Khan waxed vehement.

"Brothers," said he, "Dire disgrace has fallen upon this village. We have searched the roadside till we be tired men. Never has it been known that a beaten quail failed to return for his punishment."

His listeners wagged their heads, and with one voice exclaimed, "May the jackals feast on him tonight."

Fate decreed otherwise, for as these words were uttered, high up in the dark sapphire sky, lit by the stars, a tiny rain-quail winged his happy way with a host of his kind to the distant uplands of the North

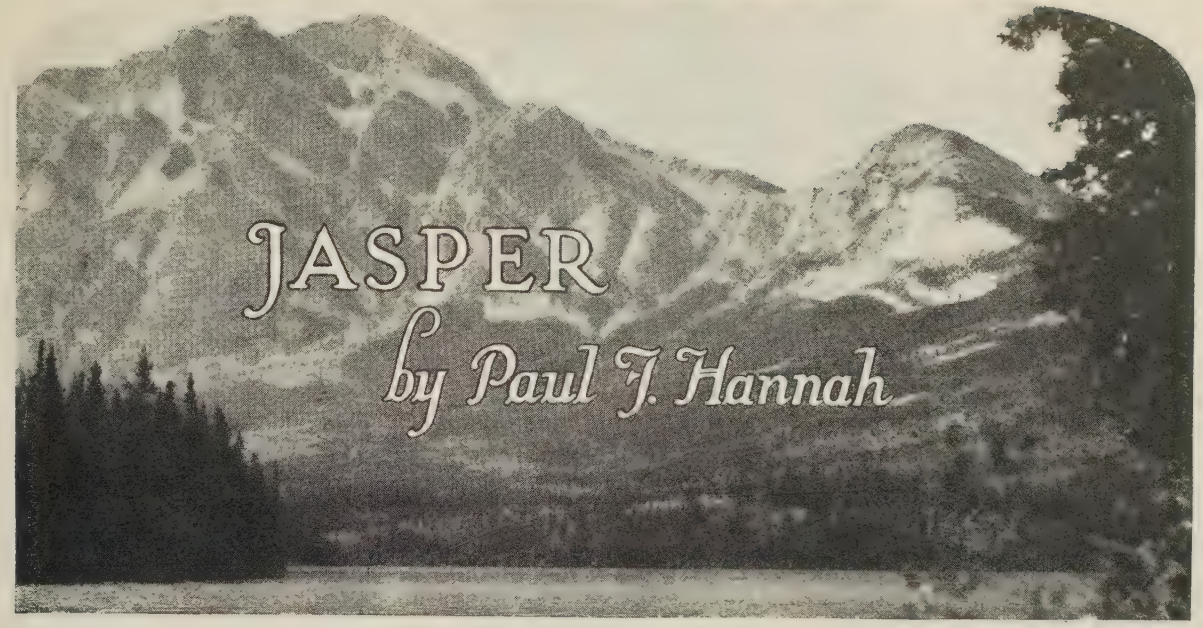
Marauders of the Fish Pool

They Discourage Fish Growers

by Edna Betts Trask

THE humble fish have enemies just as troublesome as the cat is to the bird, and one of the worst is the giant water bug, called by some electric light bugs because the adults seem to be attracted to bright lights. This peculiar type is capable of living both in and out of the water, which is the reason for its appearance in many pools in a small neighborhood. The species pictured here is known as the Zaitha and belongs to the family Belostomidae. It is over an inch long, of a dark brown color, oval shape, and has two rather broad hind legs, a sharp short beak, and two clasping front legs. Concealing itself in the mud at the bottom of the pool, it awaits the unsuspecting fish. With great swiftness, it darts out and attacks its prey by clasping its sharp forelegs around the fish, sucking the blood from its neck. The Zaitha does most of its damage during the season when the fish are spawning and makes it very discouraging to the owner of the pool who is always so enthusiastic over the increase of his fish.

One of the most interesting habits of this bug is the manner in which the eggs are cared for. The female lays her eggs on the back of the male, fastening them with a layer of waterproof glue—much to the displeasure of the prospective parent. Often, this duty of nurse-maid so irritates the male bug that he hides himself for days, until the eggs hatch.



JASPER

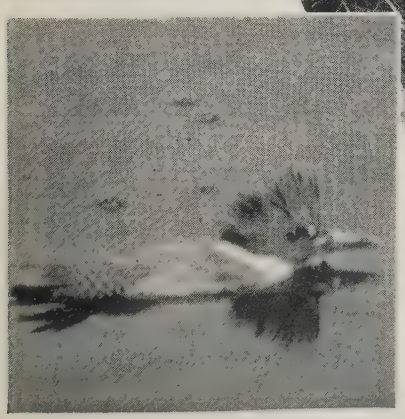
by Paul J. Hannah

Jasper National Park, Canada, has been added by the American Nature Association as one of the objectives of its Nature parties, lending itself particularly by its wildness to these particular types of visits. "On Western Trails", is the title of the booklet describing the 1930 trips and it will be mailed to all interested. It is well worth considering in making your vacation plans.

We stood at the foot of Angel Glacier, directly under the towering ramparts of Mt. Edith Cavell, on a cold, wet September day. Mists shrouded the shoulders of the great peak above us, just as they had blotted out the distant horizon along the twelve mile ride from Jasper Lodge. Steam rose from the rocks lying on the glacier's surface. The rain blew in our faces; it froze on our gloves—still we stood there, as if entranced. He was the first to speak, and his voice contained all the hopelessness of a man who sees great riches before him and realizes that he cannot take even a small share.

"And this is but one of the glories of Jasper! To think that there are over five thousand square miles of them in the Park!"

His was the feeling of nearly every one of the twelve thousand people who yearly visit Canada's greatest preserve. When such wonders are opened up before them, how can they choose but a few, and leave the rest unexplored? The beautiful Athabaska Valley and its gigantic peaks and great sprawling lowlands; the Tonquin country, magnificent in its unexplored Ramparts; the Columbian Icefield and headquarters of the North Saskatchewan River, containing one of the largest icesheets south of the Arctic—each section has an appeal that can hardly be denied. Yet one summer, and even two or three, are not enough to drink in all their beauties. The alpine meadows and the deep woods call to the botanist; each syncline and bank of boulder clay urges the geologist to linger to explore the Record of the Rocks; the bird and animal life that abounds in the park, that has become the largest wild life refuge in the world, has a way of luring the



TO BE FOUND IN JASPER

A pair of Canada geese nest along a lake, while a king-fisher and a mountain goat, both park denizens, look on

visitor to the exclusion of nearly everything else. And there is never enough time to take in them all.

The land of "magnificent distances" is Jasper. The great mountain ranges, remnants of ancient sea-bottoms hoisted skyward by the gigantic forces creating the Rocky moun-

THE FRIENDLY POSEUR
The black bear is the garbage-glutton in Jasper as elsewhere

CANADIAN NATIONAL RAILWAYS

ernment, that, profiting by the example of the United States, has set aside great tracts in the untouched Canadian Northwest for the eternal preservation of the natural wilderness. Its 5,380 square miles comprise more than half the total area of Canadian preserves and form a major part of a great chain of "open spaces" that extend straight north for three hundred unbroken miles from the southern tip of Banff National Park and reaches out to include the foothills both east and west of the Rockies. Jasper adjoins Mt. Robson National Park on the Alberta-British Columbia Boundary

MALIGNE LAKE
As beautiful in its way as is dainty calypso, the orchid of deep glens

tains, run from northwest to southeast, and cutting across them, frustrating the attempts of the peaks to dominate the land, lie three beautiful valleys—the famous Athabaska, the Brazeau and the North Saskatchewan. Time has carved great meadows and rolling hills; glaciers have added symmetry and curve, to create a simple grandeur with perfect proportion of mountain, lowland and water. There is a touch of the freedom of the plains in Jasper which relieves the harshness of endless miles of naked summits and serrated ridges. And the brilliantly colored lakes—some opaquely green, some amethyst, some a thousand shades at once, form the jewels for which the mountains and valleys are but settings.

Jasper is primarily a monument to the foresight of the Canadian Gov-

KILROY HARRIS

line and Rocky Mountains Park at the south. In the entire region wild life is inviolate, forests are to be preserved, and, though highways to open the section will be built, the pony and pack train will continue for years to be the principal mode of locomotion.

This wilderness, broken only by the twin razor edges of the Canadian National railroad, which alone open it to the world, has played almost a lead-

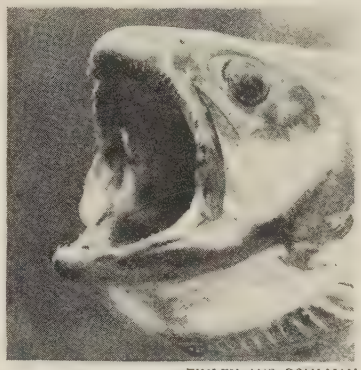
CANADIAN NATIONAL RYS.

IN JASPER IS SANCTUARY

Both the ptarmigan and deer are increasing rapidly in the Park. Savage-mouthed rainbow trout, however, are still legitimate prey

ing rôle in the building of the Canadian Northwest. Four waves of pioneers tramped along the rushing Athabaska, seeking the natural gateway through the Rockies to subdue the rugged Nature of a rich land. The fur-traders, with their burdens of pelts, representing the first harvest from the centuries of undisturbed wild life propagation, were the first to follow David Thompson, who discovered Athabaska Pass in 1810; then came the scientific explorers, trying to understand the endless variety of Nature in this new land—and among them David Douglas, godfather to the Douglas fir, who on one occasion packed 43 pounds of precious seed on his back and brought them over the Continental Divide. The rush of gold-seekers in the middle of the century was doomed to disappointment and in many cases, death; but the railroaders, racing for a route to link Pacific and Atlantic, found their dreams realized in Yellowhead and Athabaska passes. In 1909 came the first rails, and these alone have survived a greedy Nature that is bent on conquering all signs of man's coming. Now the tourists have found the land, to rejoice in its wildness and its endless charm.

The picturesque cavalcades of fur-traders found, when they roamed the Athabaska country, a superabundance of animal life, but excessive hunting and trapping—not for sport, but for sustenance—gradually drove the wild life away from the trails. When the Park was created in 1909, continued Indian hunting had sadly depleted the furbearers and big game. Since that time, however, with-



FINLEY AND BOHLMAN

ASAHEL CURTIS

CANADIAN NATIONAL RAILWAYS

in the closely guarded boundaries of the preserve, animal life has been coming back. Bear, sheep, goat and deer are found everywhere, quite frankly curious about men, and unafraid. A herd of over 100 goats live precariously on Boule Roche, and nearly 10,000 others range from Pocahontas to Athabaska Falls, along the north fork of the Snake Indian River and in the Maligne and Medicine Lake Valleys. Silver tips and black bears call the country their own. Elk are so tame as to wander close to Jasper Lodge, although their usual stamping ground is the Maligne range and the upper Athabaska. Moose abound in the willow and aspen groves, driven to sanctuary by shooting in the country to the east. Caribou, mountain representatives of an arctic race, are found in two regions—the Snake Indian and the Tonquin Valleys. The furbearers,—mink, marten, otter, and fisher,—are recovering from the depredations which marked the nineteenth century. Every lake, nearly, boasts of its quota of beaver, and two lodges are in plain sight of the highway at the northern end of Lac Beauvert.

Marmots whistle from every rocky patch, and peer above the friendly boulders to watch the traveller pass. "Haymakers" or pikas continue their harvesting under overhanging rocks. Several varieties of squirrels and chipmunks and many smaller species represent the small mammal population, and grow fat along the trails from bribes offered in exchange of a pose or two.

The predatory animals are restricted to a few wolves in the northern section, the beautiful lynx, periodically numerous, and many coyotes. The balance of Nature, so often upset in American Parks,

TWO OF THE PARK FAVORITES

The giant carpets of pink heather make the beauty of the alpine meadows. Friend whiskey-jack is the Park alarm clock

CANADIAN NATIONAL RAILWAYS

MOUNT COLUMBIA

The second highest peak in the main range of Rockies, and the highest in Jasper Park

is little changed in Jasper. Man has not yet had time.

The task of surveying to completion the plant life of Jasper still remains, although the Tonquin Valley and Mount Edith Cavell region has been quite thoroughly canvassed. One does not need to be a botanist to appreciate, however, the alpine gardens and the flower-strewn slopes in spring. April has hardly opened in the Athabaska valley before white anemones and yellow snow-lilies are racing the retreating snow up the hillsides, to give way in their turn to Philadelphia lilies and wild rose. Gaillardias line the open trails, which, when they turn to wind among deeper woods, disclose twinflowers and white queen-cups. The snow-flowered dryas covers many a gravelly patch of ground. Red and yellow columbine abound; the calypso, fairy-winged, one of the most beautiful of mountain orchids, awaits the flower lover in the shady depths.

It is in the loftier meadows where the flower symphonies swell to most exquisite heights. Little Shovel Pass, on the usual tourist route, and Marmot Pass defy description when early summer comes to Jasper. Larkspurs, forget-me-nots, arnicas, paintbrushes—these flowers and a host of others cover the slopes. And even up beyond the treeline many delicate blooms,—moss campion, snowlilies, monkey flowers and a variety of heaths and herbs,—find precarious frigid homes in the rocks.

Tree life is not prominent in Jasper, it is too far north and too high in altitude, but all the representatives of the Canadian and Alpine zones are there, among them the jack pine, Engelmann spruce, fir and other evergreens. Great groves of timber dot the valleys, but as the trees give up the struggle at 6,000 feet, much of the park is naked rock, or else given over to hardy shrubs and herbaceous plants.

There are but three geologic periods not represented by outcroppings of rock in Jasper, and it has been a mecca for geologists ever since it was known. This home of the Columbian Icefield and several hundred lesser glaciers gives marvellous opportunity for glacier study, and the sharply-cut cliffs and canyons present unexcelled examples of the twisting and turning of rock strata. You will see in Jasper, among thousands of other things, the ripple marks of stranded beaches 8,000 feet above the sea, marking the spot where once the tides of ancient oceans ebbed and flowed.

Birds are many and varied here. Grouse drum in the lowlands, and "foolhens" live up to their name. Whiskey jacks, or Canada jays, and chickadees keep the day noisy The ospreys and eagles rule as monarchs of the crags. In the little mountain streams the water ouzel splashes, while the lakes afford a great population of water birds —the fantastic loons and grebe, goldeneyes, mergansers, mallards, butterballs, and a host of geese. Teals disturb the reflections of mountains as they float over the surface of the ponds. Owls of several species here hunt their murine prey, and the hawks haunt the hills. The ornithological record has yet to be completed, however, so one enters as an explorer, and leaves with the joys of many fresh discoveries.

Such, in too few words—and too prosaic ones—is Jasper. It is a Canadian treasure chest where are stored numberless wonders of Nature. And above all, it is Canada's generous answer to the call of the outdoor lovers of an entire continent; it is a solemn pledge that the wilderness of untold centuries, the wilderness of the pioneers, shall not be destroyed.

CANADIAN NATIONAL RAILWAYS

SHEEP ALONG THE TRAIL

Not an uncommon sight along the way in the greatest of Canadian preserves

THE PACK RAT, WITH STEALTHY STRIDE, DEPARTS WITH HIS PLUNDER, WHILE HUMANS SLEEP

THE FREE TRADER *of the* WEST

He Swaps and Swaps, and Always Wins

by Dan McCowan

Illustrations by R. Bruce Horsfall

IT didn't take him long to find us. We had hardly moved into our camp about fifty miles south of Lake Louise when he let us know he was around, by swapping a spoon for a pine cone; then he borrowed a tin cup, and left us a stick for security. During the first night, we could hear him poking about under the cabin floor in his sociable way. His hind feet went "tap tap tap" on the hard pine boards. Our friend, the banker, from Montreal, who was taking his first pilgrimage to what he smirkingly called "God's Country", fidgeted and jumped, and suggested ghosts and haunted houses and Conan Doyle, but Joe, the half breed, snorted contemptuously: "Huh, no banshee here. Only pack rat. Him moved in."

Then, next morning, the clean-looking little fellow with the grey fur wrap and

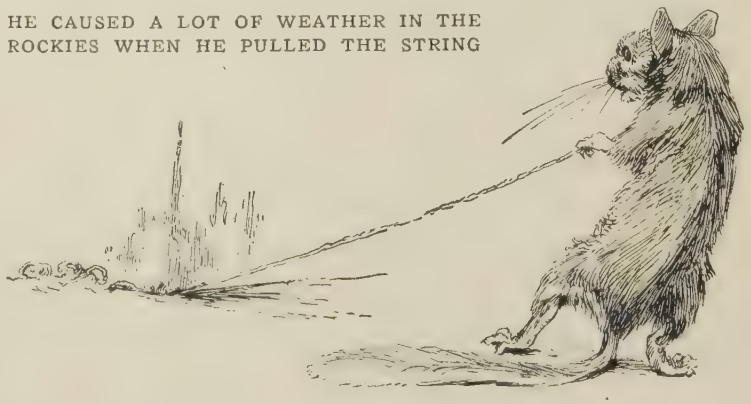
THE PRACTICAL JOKER CAREFULLY BURIED THE BANKER'S MOLARS

the impertinent busy tail caused a war in our peaceful, happy camp. Our banker had lost his false teeth. He had placed them beside his bed, he roared, and he stalked up and down the cabin mumbling threats of violence against the individual whose misguided sense of humor had caused him to replace his dental necessities with the skull of a squirrel. He kept eyeing the grinning Joe; and it was almost evening before the woods-wise guide really saw the seriousness of such rage, and led the way to a nearby rat "museum", where amid the bric-a-brac of many robberies, the pack rat had placed the missing molars. Whereupon our friend called on the Bank of Montreal, the U. S. Federal Reserve System and the Canadian Mounted to exterminate this practical joker of the western forests and hills.

It would be hard to remove

the activities of the pack rat, however, from the western regions. While not abundant, he is evenly distributed, and each year he has several litters of young in the soft grass and hair nests with their bulwarks of twigs, reed roots and cactus burrs. Of course his enemies are legion—hawks, owls and eagles attack from the air, while wild cats, weasels and the coyotes are eager to pounce upon him—but he is quick, and intelligent, and his prominent, bright eyes see everything. Since the epidermis of his tail is loosely attached, a good many times his life has been saved by the skin thereof. Man hardly molests him. The wranglers and rangers seem to appreciate—with limitations—his unconscious practical joking and his robberies. He has no economic value, and though he will nibble corn, potatoes and some grain, he is no bother. Perhaps his sociable qualities keep his ranks filled—for he prefers human surroundings, where the wilder animals do not come, and every inhabited cabin has a family under the floor. He does not hibernate during the winter, but lives on his store of nuts, roots and fruits collected with his well-known pack habits.

HE CAUSED A LOT OF WEATHER IN THE ROCKIES WHEN HE PULLED THE STRING



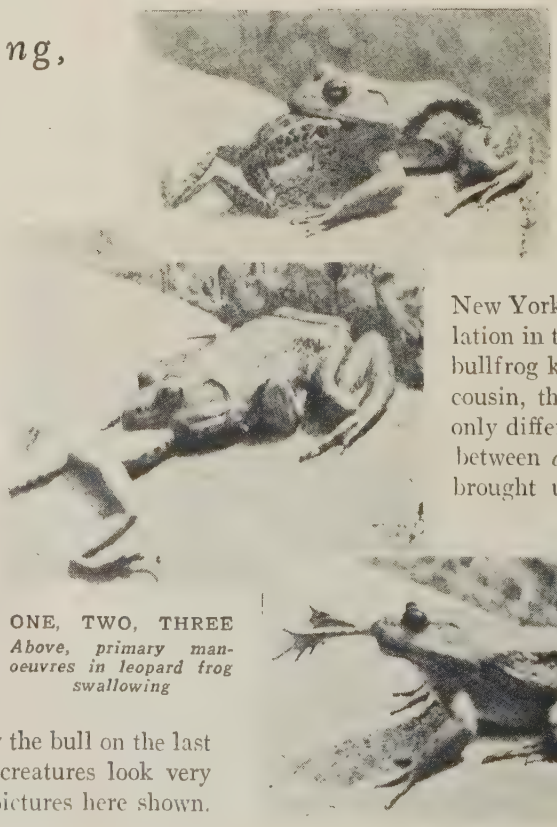
The "trader", or "pack", or "mountain" rat is really a wood rat, who has adapted himself to life in the frozen wilderness of the sub-arctics as well as to that of the semi-tropic deserts of the South.

There is a meteorological observatory situated on the summit of a high mountain in the Rockies. The instruments, all of the self-recording type, are visited only once in a while. One day, a new weather-clerk who had been sent out returned to his station with his eyes popping out, and gasped that the weather had just gone crazy. His superiors examined the thermograph charts—the temperature had fluctuated violently from between forty below to the boiling point during the past four days. Consternation reigned. Investigations worthy of the Senate started. Then it was found that a loose piece of string had been pulled off a shelf by an acquisitive pack rat, who had entered the bureau for reasons of his own. In going out, the string had caught in a crack in the thermograph case. Every time the rat pulled on the cord, he moved the delicate needle. For four days he struggled for the possession of the string, while the temperature, to all appearances, grew hot and then cold. Persistence has the pack rat—that, and an affection for bargains.

Going, Going, Gone!

The Sad Case of the Leopard Frog

by Al. Friedland



ONE, TWO, THREE
Above, primary manoeuvres in leopard frog swallowing

THE FINISHING TOUCH
"And that was the end of the frog, the frog."

THE CONTEST this time was not between a bullfrog and a bulldog, but one in which old basso profundo and a leopard frog were on opposites of the question. It matters little whether the spotted son of *Rana* called the other a "green old water fool", or whether he merely looked like a good meal—the result was the same. The argument was won by the bull on the last swallow. Neither of the creatures look very pleased, however, in the pictures here shown.

The gastronomic feat took place in my museum near Cold Spring, New York, and caused much philosophic speculation in the minds of those who saw it. Did the bullfrog know that he was swallowing his own cousin, that both of them were *Rana,* and the only difference between them was the difference between *catesbiana* and *pipiens?* Had he been brought up poorly in matters of dining etiquette? Was he deficient in zoology? The general conclusion, however, resolved itself into the following result: "One bullfrog, full grown, but not able to swallow."

WARS of the ROSES

Battling the Beauties' Fearsome Foes

by C. T. Gregory

Purdue University Agricultural Extension Department

BROWN CANKERS
Appearing on the stems, causing purplish blotches

When I was a boy the rose bush never received much attention. It stood at the corner of the house and bore a profusion of blossoms in June which soon withered and lost their petals. No one ever gave it a thought except perhaps to slash off a branch that hung out too far and caught at our clothes with its multitude of thorns. And, through all this neglect and misuse the bush thrived, bearing its yearly crop of old fashioned roses.

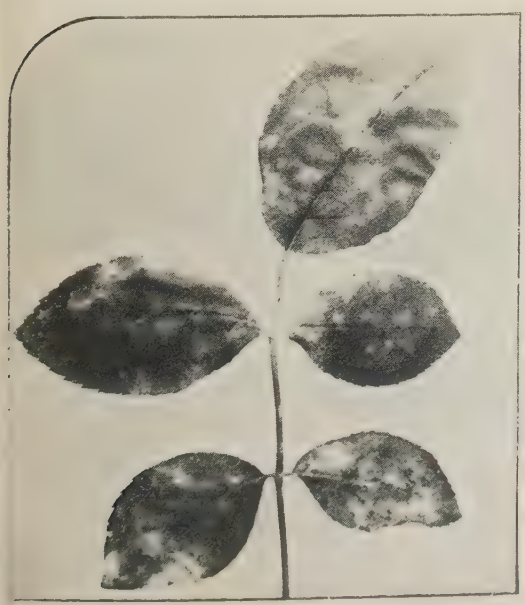
Now, however, things are different. The rose has been refined and bred into a gorgeous flower with a long beautiful bud. With all this refining it would seem as if some of the sturdy hardiness of the old fashioned bush has gone. But, few of us would discard the new for the old. With all its weakness we love it more and must be ready to fight for it. We must save it from its invisible enemies, the fungi.

One of the most common of these diseases on all types of roses is the black spot disease. Black circular spots develop on the leaves. Sometimes there is only one large spot and again there may be numerous small ones, but in either case the leaf turns yellow and soon falls from the plant. Often the disease practically defoliates the bush.

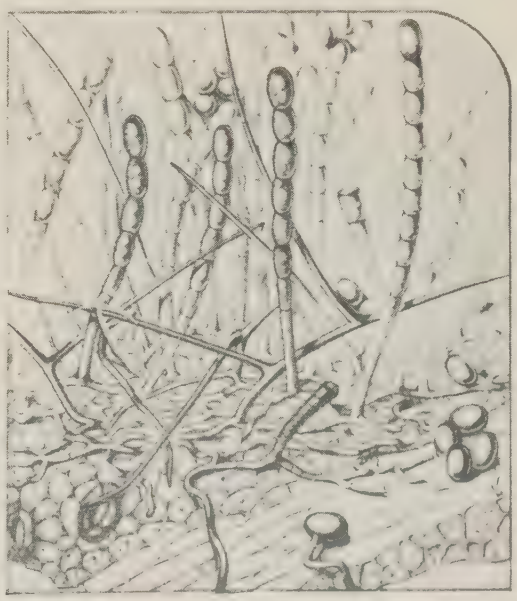
The fungus causing black spots goes by the name of *Diplocarpon rosae*. During the summer when the weather is wet it spreads rapidly by the spores that are formed on the diseased leaves and blown by the wind. On the wet leaf the spores sprout and the germ tube grows down into the tissue, producing another spot. During every wet spell in summer this process is repeated. The infected leaves fall to the ground carrying the fungus with them.

This summer stage cannot withstand the dry cold weather of winter so a wonderful change takes place within these dead leaves on the ground. The fungus changes its habit of growth and produces another kind of cold resistant spores. They are eight in number and are enclosed in tiny sacs embedded in the old rose leaves. In spring when the weather warms and the new rose leaves are again peeping forth from their winter buds, the fungus renews its activity. The winter spores are ejected from the sacs by hydrostatic pressure and once freed from the sac they are easily splashed or blown to the new leaves. They sprout there in a drop of water, enter the leaf and in ten days' time a new black spot has appeared. Again the fungus is ready for its summer of destruction to the rose leaves.

Way down South where it is summer all winter it is possible that the fungus does not need the winter stage. It may live as the summer stage. This makes the fight just that much more difficult but it is by no means



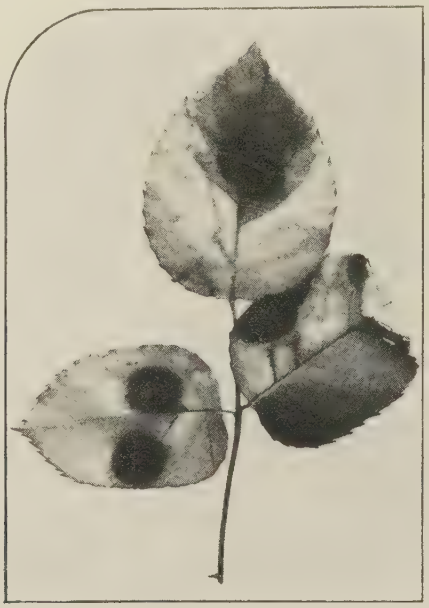
ROSE MILDEW
At the left. One fights it with sulphur dust from spring to fall



HOW IT GROWS
Mildew is a fungus growing on the surface of the leaf

hopeless. Surely science can find a way to check it.

This is the way the fungus lives. How shall we stop it? Not so difficult if we will consider the life of the fungus and fight accordingly. First let us attack it in its winter quarters and rake and burn all the fallen rose leaves in autumn. This will eliminate much of the danger but not all because remember this is a tiny plant and does not need much to live on. Its necessities are few.



BLACK SPOT
The summer stage of a virulent pest

In spring and summer we must protect the leaves with sulphur dust. This of course means the special dusting sulphur that has been ground exceedingly fine. There is on the market a special rose dust that has been colored green so that it will not discolor the leaves. Apply this dust every week or ten days during the spring when the weather is wet. In summer if the weather is hot and dry it will not be necessary to dust so often, perhaps once every two or three weeks. The dusting must continue in the autumn as late as October.

Another common trouble of roses is the mildew, a disease that powders the leaves, buds and young stems with a white growth. It will curl the leaves and blast the buds. It is most serious on the climbing types of roses. Ordinarily it is the first disease one notes.

Mildew should cause no great concern to the grower if he will only be prepared with the sulphur dust. As soon as the disease appears a few puffs of the dust gun will cover the vine with the sulphur and will effectually get rid of the trouble. But let no one be deceived by the disappearance of the mildew,—it will reappear later on the new leaves. The control is a matter of vigilance.

The rose is also susceptible to several canker diseases. Crown canker causes the death of the stems at the crown and may kill part or all the bush. Brown canker attacks the leaves, flowers and stems, causing purplish dead areas. Stem canker is another disease similar to brown canker but caused by a different fungus. Watch for dead or dying branches of the bushes and cut out the diseased parts below the canker. In cases of severe infestations these canker fungi can be held in check by spraying with ammonical copper carbonate from five to seven times during the season, beginning when the new growth starts in spring.

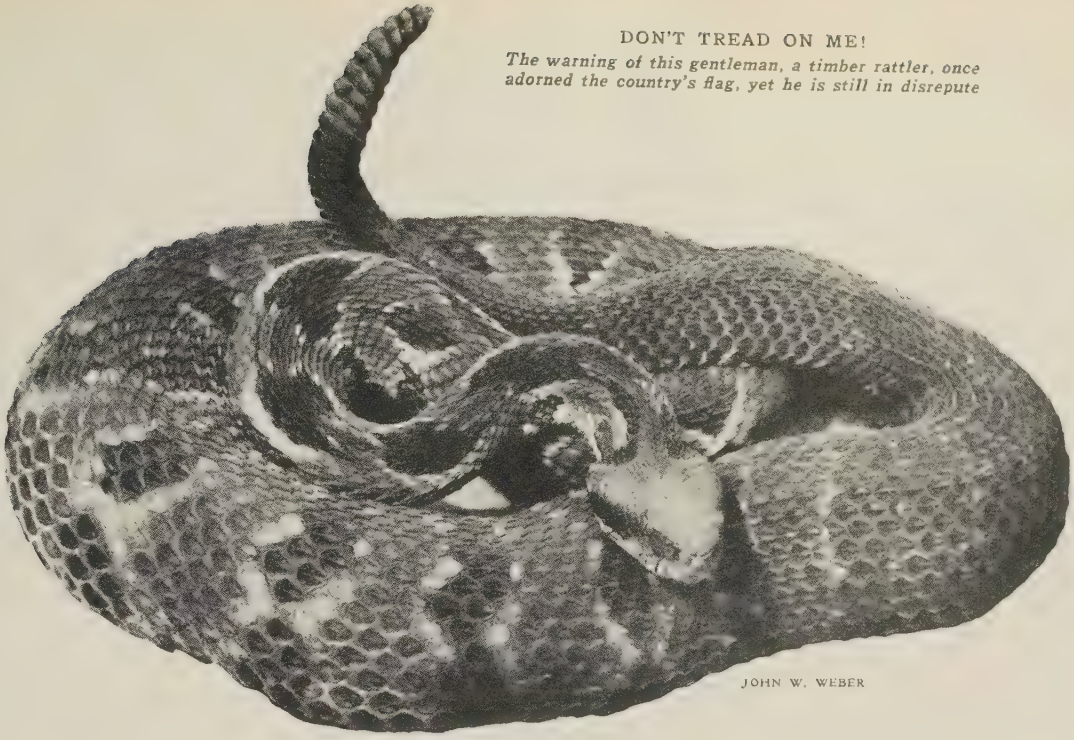
The sulphur dust for roses may be mixed with lead arsenate or calcium arsenate and also with any nicotine

RUINED BUDS
Rose mildew struck them down quickly

preparation to control various leaf eating and sap sucking insects. These include the slugs, red spider, lice and leaf hoppers. When scale insects are serious on the rose bushes it may be necessary to cut and burn the most heavily infested canes. A spray during the dormant season with any of the oil sprays will kill the scale. Lime sulphur at the strength of one gallon in ten gallons of water is also effective but this spray should not be used near the house because lime sulphur blackens paint.

Most roses need some protection against winter injury. Ordinarily this simply consists in mounding the soil up about the stem to a height of ten inches and then covering lightly with straw. Certain of the tender hybrid teas must be buried in a mound of soil or wrapped with straw. The hybrid perpetuals, Rugosa and hybrid Rugosa, and moss roses are all hardy without protection.

Spring and the rebirth of wild flowers and trees, the northward swing of the birds, the call of the open, are all expressed in the April issue of Nature Magazine. Among the features of that issue will be stories on Bird Songs; John Burroughs; Skeezix, a White Coyote; the Peregrine Falcon; Spring Peepers and other stories of the springtime that causes snowbound life to awake once more.



JOHN W. WEBER

DON'T TREAD ON ME!

The warning of this gentleman, a timber rattler, once adorned the country's flag, yet he is still in disrepute

THE HUMBLE WAY of the SNAKE

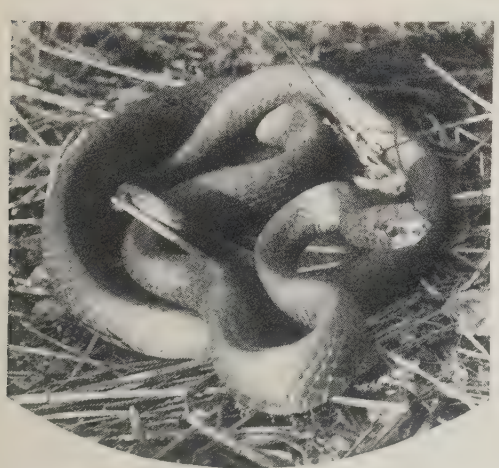
As Revealed by Photography That All May Practice

by L. W. Brownell

Photographs, Where Uncredited, by the Author

EVER since the snake was held responsible for man's expulsion from the Garden of Eden, no other animal has been so universally hated and feared. One reason probably lies in the fact that a number of the species are dangerously poisonous, and some are even deadly; but a still more potent reason is born in their stealthy manner of motion, and their silence. It is a heritage of man's primitive existence to fear that which moves without sound. And still this prejudice runs on through civilization, though in a great majority of instances, it is entirely without cause or real justification.

It is almost impossible to make a large majority of people believe that not all snakes are poisonous. I know, for I have tried it. I well remember seeing, some years ago, on a country road along which I was riding on a bicycle, a ring of half-a-dozen men and boys, diligently throwing stones at something in a fence corner. I dismounted to find out the cause of the excitement and discovered that the object of their animosity was a little garter snake about two feet long. None of them,—and four were grown men,—had the courage to face this little creature at a distance of less than ten feet. As they

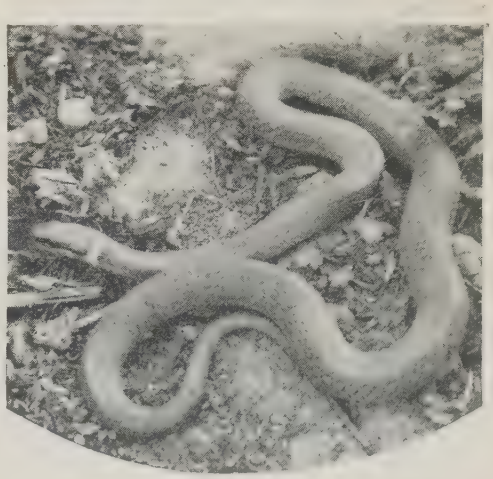


RARELY POSING

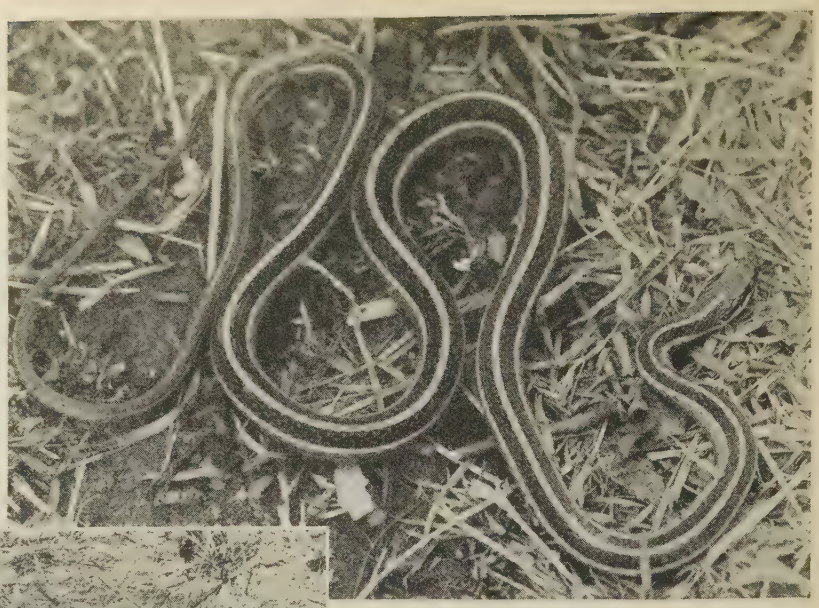
The ring-necked snake at the right is very secretive, but when found is not hard to photograph

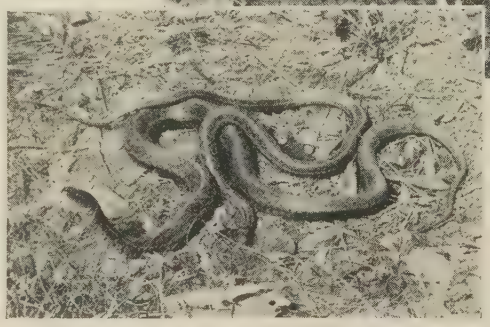
A BLACK SNAKE

A constrictor, forsooth, but quite harmless to man, who persecutes him



were exceedingly bad shots the little reptile, when I arrived, was faring not too badly. I will never forget the looks of utter horror and amazement with which they watched me as I picked up the little creature. Of course they shouted warnings at me not to go near it or it would surely kill me, and when I reached down to take it I am quite certain that they all expected to see me drop dead before their eyes. As I held it in my hands and walked toward them to try and convince them how really harmless it was they backed away as though they expected it to spring from my hands and attack them, nor would they be persuaded that it was not a deadly creature. Even as I rode away, with the snake in my pocket, they shouted after me that it would certainly eventually bite and kill me, and I am positive that they really considered me a doomed man.



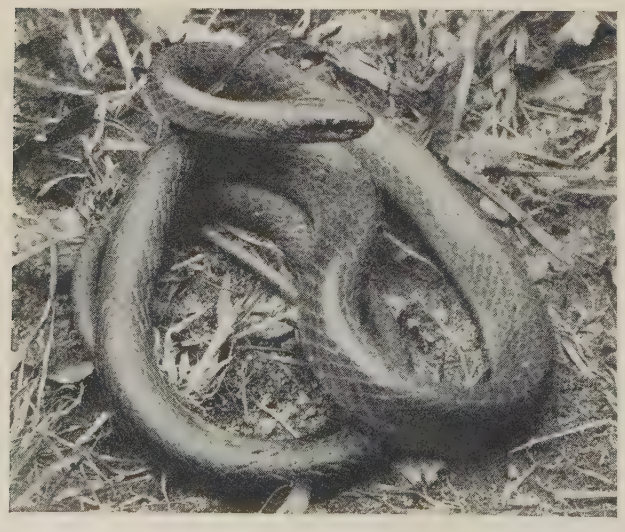


THE HANDSOME RIBBON SNAKE SIGNS HIS NAME

At the right a pair of harmless garter snakes bask in the sun

NO RATTLER'S POISON HARMS THE KING-SNAKE

The gentleman below is master in battle, while the grass snake, at the bottom, picks no quarrels at all



The belief exemplified by these men has been fostered from time immemorial by the great number of myths that surround these creatures. Among the more common of these concerns the "hoop snake" which forms a hoop of its body by taking its tail in its mouth and rolls after its intended victim with incredible velocity, according to the fairy story often told. This has a variation in some parts of the South wherein the snake eventually brings up against a cotton-wood tree which begins to fade within the hour, and in less than a day stands charred and black, poisoned by the frightful venom sent into its bark. Another figment of someone's vivid imagination is the "whip snake," having a sting on the end of its tail with which it strikes and kills its victims in much the same manner as one would use a quirt. Possibly this tale was evolved from the red-bellied or horn snake, a southern species with a spine on the end of its tail, which, however, is harmless. The hypnotizing effect of a snake's eye that will enable it to gain such control over its prey that they will fall easy victims, is quite a widespread and common myth, as is also the one that endows the snake with the power to eject a stream of poison from its mouth for a considerable distance. The one which makes of the snake a revengeful creature that will follow a person who has killed its mate until the opportunity offers for retaliation is, perhaps, not quite so well known but is, nevertheless, held in a stubborn belief by a large number of people.

The absolutely ridiculous articles that are allowed, from time to time, to creep into the news concerning these animals helps to keep alive the fear of them. Quite frequently I see in the daily papers such items as "Killed by the Bite of an Adder," "Terrible Fight with a Blacksnake," "Bitten by a Water Snake, Dies Horrible Death." Editors who publish such items would do

well to acquaint themselves with the habits of the snakes before making themselves the object of laughter to those who know, and giving misinformation to those who do not. Not so long ago I remember reading, in a New York paper, a long account of a woman in Colorado who fought a band of rattlesnakes for two hours and killed, if I remember rightly, two hundred and fifty of them, using nothing but a stick as a weapon. This on the face of it is manifestly ludicrous, for the article went on to say that the snakes attacked her in a band for no apparent reason which, incidentally, a snake never does under any circumstances. Moreover, if such a thing should, by the wildest stretch of imagination, ever happen, nobody, no matter how active he might be, could stand off such an attack single-handed without being badly bitten.

As a matter of fact the snake is more or less of a gentleman. His first instinct is to avoid mankind when possible and attend strictly to his own business when allowed. There are, unfortunately, altogether too many people who cannot see a snake without being attacked with an overwhelming desire to kill it. Any snake will show fight when forced to do so but it will always avoid battle when possible. Even the rattlesnake will give warning when too closely approached and will strike only as a last resort. It acts entirely on the defensive. In fact, it is capable of being handled with impunity if one does so in a gentle manner and with no show of fear. I cannot, however, go so far as to advise you to try the experiment.

Public sentiment to the contrary, it is a fact that, of all the species of snakes native to the United States, there are only four that are poisonous. To be sure the rattlesnake, the most dangerous of them, is divided into a number of varieties some of which may be found in every state in the Union. The northern rattler is comparatively small, rarely attaining a length of more than four feet. His "bite," while dangerous, is not necessarily deadly. Those of the South and Southwest often grow to a length of seven or eight feet and their "bite" is almost tantamount to a death warrant. The moccasin, that much feared reptile of the South, is a dweller of the swamps and morasses and, moreover, is so sluggish that one may step over him, as I have frequently done, without his showing any resentment. The copperhead, the rattlesnake's nearest relative, is distributed over the northeastern portion of the country and is nowhere common. Its "bite," while very unpleasant, is never fatal unless entirely disregarded. The fourth of the poisonous species is a comparatively small snake found in the far South and called the coral snake, because of its alternate bands of red, yellow and black. This is really a dangerous snake, related to the cobra, and its "bite" has been known, on several occasions, to cause death. Fortunately it is rare and, even more fortunately, it is hard to anger and may even be handled without fear of bad effects if one will but do so in a gentle manner. This I proved accidentally, and I have never since ceased to be glad that it was a fact. Some years ago, when I knew little concerning snakes but thought I knew a great deal, I spent some months in the wilds of Florida on a collecting trip. One day I saw one of these little fellows directly in my path and, as I had always handled snakes

NOTHING SO UGLY AND LESS HARMFUL

The water snake looks mean, but he will not attack

JUST OUT OF THE EGG, AND NOT DRY

A few milk snakes survey the world for the first time

LYNWOOD M. CHACE

ONE OF THE DWARFS OF SNAKEDOM
De Kay's snake is rarely more than a foot in length

and liked them, I picked it up and took it to camp with me thinking, of course, that it was a harmless species. There I kept it for more than a week, playing with it every day, until it finally escaped, and in all that time it never once turned on me or showed the least irritation. It was not until some time later that I learned that I had been handling a dangerous reptile.

Aside from any other considerations in their favor snakes are of considerable economic value as destroyers of rodents and insects. As such they should be protected instead of being persecuted by nearly everyone at every possible opportunity. The one and only real offence of which most snakes can be accused is the robbing of bird's nests, and this they will do whenever the opportunity presents itself.

As subjects for our cameras snakes prove to be most interesting and while their quickness of action makes them rather hard to pose successfully, still, with patience, one can accomplish much. Possibly the idea of posing anything so elusive as a snake may seem ridiculous to some; nevertheless, I can assure you that it can be done effectively although, it is true, they cannot be induced, under ordinary circumstances, to hold the pose very long. Snakes are characteristically long and slender and a photograph of one stretched at full length would greatly resemble a string laid on the ground. It is therefore necessary to make them assume some sort of a coil. This allows a nearer, and consequently, larger view and shows to the best advantage their natural grace of outline. It is not difficult to accomplish. First, one must never be afraid to handle his subjects. I have frequently succeeded in so quieting a subject by holding it gently but firmly and softly stroking it upon the head and neck that it would remain motionless in one spot for several minutes,—long enough for me to focus my camera and obtain a picture.

If another method is preferred, the following plan will always work if one but uses sufficient patience: set up and focus your camera upon a certain piece of ground. Stop down your lens until you have a depth of focus that will give sharp definition over at least a foot of ground. Now mark the four sides of the spot wherein your subject must be in order to be in sharp focus, set your shutter, insert your plate holder and pull the slide ready for an exposure. Now herd your subject carefully into this space. This can be done with patience and after some experience by carefully guiding him with a stick. Never strike him. When the end of his tail is within one boundary, even though his head may be past the other one, strike the ground sharply with your stick directly in front of his nose. This will cause him to draw back into a fighting attitude, and he will usually hold this pose long enough for an exposure. If any part of his body should extend beyond your boundary marks you will have to try again until you get him where you wish him. Several of the accompanying photographs were made in this manner, noticeably those of the water and ribbon snakes.

This method is particularly effective with the poisonous species for it is easy to make them assume a defensive attitude and this they will keep so long as you are just outside their striking range. One must be particularly careful, however, not to allow any portion of their body to come within this range, which is about one-third of

HE LIKES TO POSE FOR THE CAMERA
The hog-nosed snake is a big bluff when in a battle

their total length. An instant of carelessness will, almost certainly, result in being struck. The strike of a snake is probably the most rapid of any animal movement and it seldom fails to reach its objective.

The little hog-nosed snake, or puff adder as it is more commonly called, a picture of which appears on another page, is one of the easiest of all the snakes to photograph. In looks and actions he is, apparently, one of the most ferocious, but his actions belie his nature, which is gentle in the extreme. Small, rarely two feet in length, he is stockily built and, when excited or angry or in an attempt to defend himself from an enemy, he will flatten and distend his head and forepart of his body to almost twice its natural width, at the same time hissing so loudly that he can be heard at a considerable distance. His fierce demeanor is all bluff and though, in further carrying out this bluff, he will sometimes attempt a strike, he never actually does and it is next to impossible to force him to bite or take hold of anything with his mouth. He is, of course, harmless, for he secretes no poison and makes an interesting and amusing pet. When placed on the ground after handling he will assume any posture desired and keep it, usually for some time. In fact he will often go so far as to feign death, rolling over on his back and becoming perfectly rigid. Then we must wait until he comes to life again.

Of course, much better work can be done in the line of snake photography with much less expenditure of time and energy if one has an assistant. It must be one, however, who knows how, and is not afraid, to handle the subjects. Then he can do the posing while you attend strictly to the photographic end of the business. I once made some excellent photographs of a four foot black snake, one of which is reproduced with this article, with the aid of an assistant, which I never could have obtained alone, as the black snake is one of the quickest of all in his movements.

I do not want my readers to get the impression from what I have said that none of the snakes, except the poisonous species, will "bite." All of the larger snakes, with the single exception of the hog-nosed snake, may do so, but none but the poisonous species secrete any poison and their bite is not so much to be feared as that of the mosquito. I have known people to die from the bite of the latter but never from that of one of the harmless snakes.

The snake is a wonderful example of the effect of a bad reputation. His friends are helping him live it down, but the ancient prejudice exists. A few days with him as subject of your camera, however, will go far in convincing that his dangerousness is largely a myth and that after all, he is a gentleman in most respects.

THE CROW CLARK FOUND

by F. W. Schmoe

One evening not long ago I sat by my camp fire near the summit of a peak of the Cascade Range. Suddenly the restful stillness of the high places was broken by a cry. It was far from musical but it was cheery and pleasant for it was the call of an old friend of mine whom I had not seen for almost a year,—the Clark crow. A moment later the fellow dropped in on me. Dropped is a good word for that is just the way they arrive.

He is a large pearl-gray cousin to a crow with a heavy beak and wings that are black and white. His manner of flight is as peculiar as his call, a swooping, pitching, tumbling flight which takes him from alpine tree to alpine tree or from rocky crag to deep canyon with speed and safety if not with grace.

In the high country of the Northwest, where he makes his home, he is one of the most typical of our mountain birds. In the winter he has the range almost to himself for aside from him, the white-tailed ptarmigan, the rosy finch and the mountain chickadees are almost the only birds that care to brave the winter at timberline.

Although this bird, which should be called a nutcracker rather than a crow, was not actually named by Lewis and Clark, it was first discovered by them in the high passes of the Rocky Mountains and along the Columbia River and later named by Wilson in honor of the junior member of that well known expedition which made such notable discoveries.

THE BURNING OF THE FRUITS OF LABOR
The youthful campaigners watch the collection of bagworms go up in smoke

BAGGING *the* BAGWORM

by Lena V. Feighner

This story of what the school children of Kansas City, Kansas, have done in warring against one insect enemy of their trees is presented in the hope that it may serve as inspiration and example elsewhere. Its author was the commander-in-chief of the troops

KANSAS is proud of her nearly three hundred millions of trees, some half million of which line the streets of her cities and towns. Her history is written in these trees and she will rally to protect them. In Kansas City there has been waging a war, in behalf of the trees, against their most destructive insect enemy in this vicinity—the bagworm.

The bagworm is characterized by the appearance of its larva which crawls about infested trees or swings from their branches on silken threads, in a baglike case, whence its common name of bagworm or basket worm. The insect undergoes all transformations in the shelter of these cases, after which the bags remain attached to the plants for some time and are conspicuous objects on leafless trees and shrubs in late autumn and winter seasons. The bags of the females in the meantime serve as incubators for the next generation.

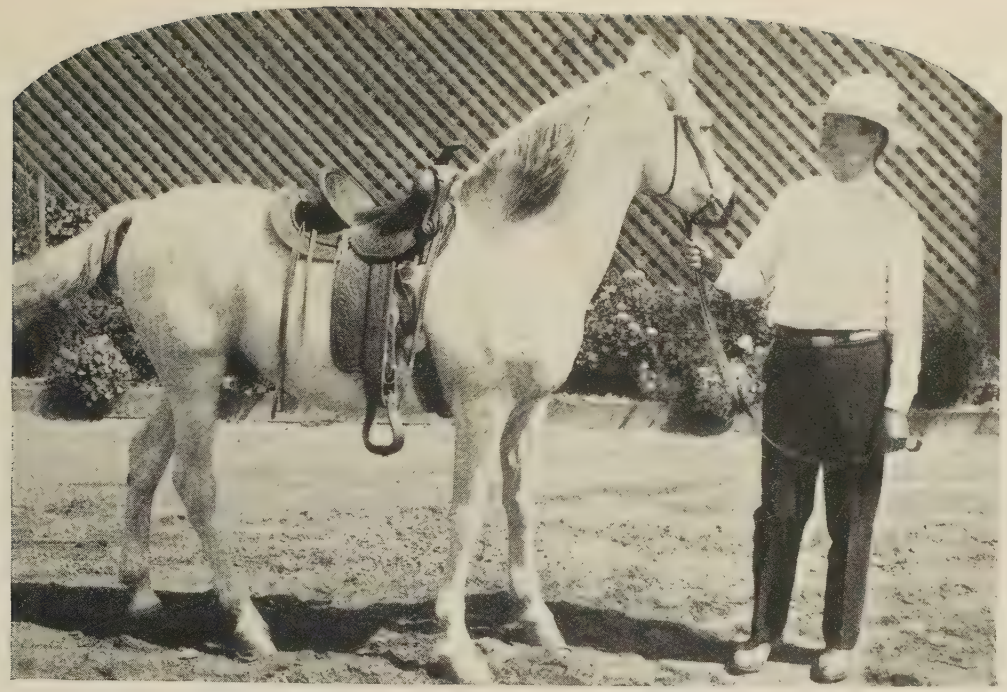
This insect is a native of North America, originating in the piedmont section of the South and gradually migrating north into southern New York and westward to Kansas, attacking deciduous and coniferous trees and shrubs. In certain years it is a very troublesome pest. Its natural enemies are comparatively scarce.

AN INFESTED BRANCH OF A TREE
Showing the way the bags of this pest hang on the trees on which it preys

The bagworm must be destroyed! So, with this as their war-cry, the boys and girls of the grade and junior high schools of Kansas City fight a "no-quarter" duel with this insect each year.

This campaign originated in one of the General Science classes of Central Junior High School in February, 1926. Some trees on the school grounds were infested with the bags. The pupils were not acquainted with the habits of this insect so the project challenged their interest and attention. Bags were brought into the class rooms for examination. Some very interesting data were collected. With additional facts received from the United States Department of Agriculture, the members of this class aroused interest in the bagworm and organized a campaign in their school, which in

(*Continued on page 190*)



THE COUNTRY NEEDS MORE OF THESE
Will Rogers, the national ego-deflater, with Letan, Arabian stallion, whose type is expected to bring new horse honors to the United States

ROYALTY COMES to AMERICA

Ancient Arab Breed to Richen Nation's Horseblood

by Uthai V. Wilcox

AN INTERNATIONAL competition, but not of submarines, long range guns, airplanes or deadly gases, has been in progress. Subject to no League of Nations, this intense rivalry concerns not only the fighting land forces of the great military nations, but also the agricultural interests and to an even greater extent, those of the sportsmen.

It is a friendly contention, however, and the goals for which each nation is striving are the purest strains of Arabian horse blood. America with all her wealth is now actively seeking prize animals of the mystic East to improve her cavalry and her agricultural animals and to give her race horses and saddle horses the stamina, grace and intelligence needed to make them winners.

From the days of King Solomon—and no one knows how long before that—the Arabian has commanded the admiration and the respect of every one who loved horses or used them. The blood of these desert creatures has come to stand for the best. Because this is true France maintains national stables for the purpose of preserving the blood and mixing it with her own stock, and Italy, England and Germany have their own royal stables where Arabian horses are kept with the purpose of giving the cavalry the best that can stand up under fire. America, due to the efforts of W. K. Kellogg, the food manufacturer, has now entered the lists that bid for this prize heritage.

Near Pomona, California, on a great ranch thousands of acres in extent and equipped with white, spotless, fire-proof stables grouped around their quadrangle of emerald turf, Arabian horses rule. There are uniformed grooms to serve them. There are acres and acres of fertile grain fields, and pastures lush and green. These forty-odd proud horses, the least of them a beautiful example of blood breeding, are kept for the avowed purpose of enriching, through breeding, America's stock.

In order that this nation may become the great leader in all affairs equine, Mr. Kellogg is propagating in a strictly scientific sense the finest horses of the Arab strains that can be bred. He already has some of the best blood in the entire Arabian world. With the help of scientists from the United States Department of Agriculture, the most modern methods of breeding are being carried on. Size, height and saddle conformation are being developed with painstaking skill. Endurance and stamina, as well as gentleness and docility are being preserved.

Mr. Kellogg seeks to do with horses what Luther Burbank accomplished in the horticultural field. He has confidence in Arabians to make a real and lasting contribution to the work, pleasure and military stock

of the country. He intends to make his horse ranch a permanent source of high-type stallions and mares—breeding stock which will perpetuate the Arabian horse in America, and which at the same time will be used to improve the rank and file of our saddle horses. He is looking forward to a time when horseback riding, indulged in by thousands, will bring increased health to a great part of the population.

The horsemen of the world all bow before the qualities that the Arabian horse possesses. Historical research has definitely established that of all horse tribes that are descended from the Libyan, the Arab has always been the most outstanding.

He is not a wild creature of the desert country, but has come to thrive in Arabia largely because the love of horses has been bred so deeply in the soul of the Arabian tribesman. Hardy, good-natured, able to subsist upon a minimum quantity of both food and water, he has been cared for as no other animal in the world. Due to the affection, and even the religious fervor and jealousy with which the Arabs regard their mounts, the demand for him far exceeds the supply. The Arab will not sell his favorite. He will not breed his animals unless their blood lines are pure. These factors have made the Arabian horse the world prize in quality and in price.

History shows that by long and careful breeding the present superior type of Arabian horses has been maintained for more than three thousand five hundred years. There is the account of how Mohammed, anxious to secure mounts that would stand up under the rigors of his campaigns, kept a hundred mares penned up in sight of a sparkling stream, but without water, for four days. Finally released, the frantic animals dashed for the stream. Just as they were within a few yards of it, Mohammed caused his bugler to sound the call to halt. Five obeyed—but the others continued their mad dash for water. These five, at the first notes of the bugle, aligned themselves in battle formation, thus proving their blood. They became known as the "Prophet's Mares"—and bred to the best Arab stallions, began what is now known as the five leading families of the type. Such is the military training.

The pure desert-bred Arabian has always been noted for courage, intelligence and endurance. Accustomed to subsisting on scant water and forage, subjected to the burning heat of the desert, he is capable, nevertheless, of carrying heavy loads for great distances. Powerful and swift, raised almost as a member of the family by the desert tribes, he is invariably gentle, affectionate and tractable.

To prove the endurance of these creatures, Captain Frank Tompkins of the Eleventh Cavalry of the United States Army and superintendent of military instruction at Norwich University, Northfield, Vermont, tried a little test over the hills of Vermont.

Having occasion to go to Fort Ethan Allen, at Burlington, Capt. Tompkins rode the five-year-old Arab horse, Razzia, fifty miles in the morning, attended to his business at Fort Ethan Allen, and rode back to Northfield the same day. The Arab carried 175 pounds on his back; the entire time on the road was fifteen hours and thirty minutes, and he was never distressed. The next morning he was in perfect condition to repeat the feat. A large part of the trip was over slippery roads and there was much rain.

The Arabian is noted for sure-footedness; he is able to run easily and without falling over loose stones and on slippery pavements.

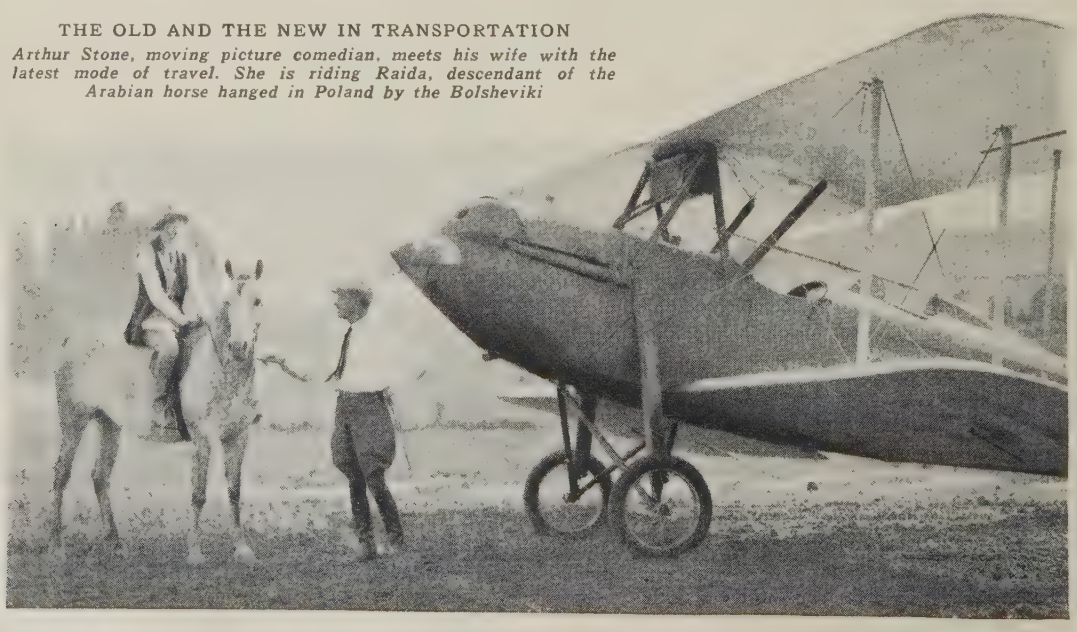
Speed is another quality. The best of the Kentucky horses of to-day have the Arab strain strong in their veins. For more than a hundred and twenty-seven years, every winner of the famous Derby descended from an Arabian. Nearly eighty-seven per cent of the winners descended from one great stallion.

George Washington rode an Arabian through his campaigns, and Bonaparte pinned his faith to the white Arab, Marengo, that carried him through his campaigns in Egypt and the freezing retreat from Russia. His stuffed skin is still preserved in Paris. Wellington would trust himself to nothing but an Arab horse. Kitchener and Lord Roberts rode no others.

There are many famous members of the famous tribe now located at this California horse ranch where

THE OLD AND THE NEW IN TRANSPORTATION

Arthur Stone, moving picture comedian, meets his wife with the latest mode of travel. She is riding Raida, descendant of the Arabian horse hanged in Poland by the Bolsheviki



scientific horsemen are utilizing them to the best interests of America. Some of the horses have blood lines that extend back to the dawn of history, perhaps to the days of King Solomon, who bred horses for the chariot trade and whose great stables have but recently been uncovered.

There is the horse Raseyn, five years old, whose sire is Skowronek, owned by Lady Wentworth of England, who refused 50,000 guineas for him. Skowronek and his sire were owned by a great Polish family at the time of the World War. When the Bolsheviks obtained power in Poland they hanged the sire of Skowronek on a scaffold as they would hang a man, because they associated the royal line of horse heritage with that of kings. But Skowronek was smuggled out with mud thrown over him so he would not be recognized, and thus he was saved from an ignominious death. It is such care and regard for Arabian horse blood as this that has given to the world the long proud line that Mr. Kellogg wishes to spread effectively about the country.

THE FINEST IN HORSEFLESH

Through centuries, the Arabian has matched perfection. Cavalry, agriculture, and horse-shows will benefit from his cultivation in America

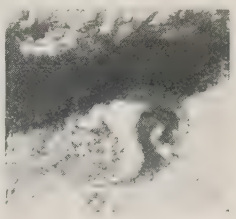
No one knows the wonderful qualities of the true Arabian better than the desert owners themselves, who live by and with their horses. The Algerian chieftain, Abd-el-Kader, said: "If in the course of your life, you alight upon a horse of noble origin, with large, lively eyes, wide apart, and black broad nostrils, close together; whose neck, shoulders, haunches, and buttocks are long, while his forehead, loins, flanks, and limbs are broad; with the back, the shin-bones, the pasterns and the dock short; the whole accompanied by soft skin, fine, flexible hair, powerful respiratory organs, and good feet, with heels well off the ground, hasten to secure him if you can induce the owner to sell him, and return thanks to Allah morning and night for having sent thee a blessing."

The Kellogg Horse Ranch not only is fitted with every scientific device for its mission but it has an airplane field and is able to send its horses, if desired by airplane to any part of the nation. Thus the oldest quality of rapid transportation is coupled with the most recent.

MOTHER LIZARD MAKES HER NEST

By Leslie L. Haskin

It was late in June when mother lizard left the rail fence which was her accustomed home and hunting ground, and went out into the dry, sandy meadow. She had great hopes. She did not choose the softest sand in which to make her nest, but sought a bank of rather hard clay, lest the trampling of hoofed feet should break through and crush the eggs. There she worked for three whole days fashioning a slanting burrow. Deep enough she made it, so that the undue heat might not dry up the eggs and cause the young to perish from lack of moisture, yet not so deep but that the sun's rays could warm and incubate them. In the bottom of her finished tunnel she placed her treasures—a dozen or more—and then carefully filled up the hole with soft dirt. There she left them, nor ever saw them again except by chance, and then did not know them as her own. Such is lizard motherhood



THE MOTHER AND HER BROOD

A teaspoon holds her entire family, and is nearly large enough for the mother, too, who seems to be hiding from the photographer

TRACKS

A Unique Method of Collecting Them

by Russell Aiken

THE NEGATIVE
This is the result of the plaster poured into the track. Note the great detail obtained

THE POSITIVE
Made by soaping the negative, and treating it as the original track was treated

THERE are only a few methods of collecting tracks. Drawing the tracks on paper after making careful measurements for size of foot, length of stride, and other details is limited to those who have at least a slight amount of artistic talent. Photography, though it has no superior when it comes to recording tracks in the snow, yet necessitates portrait lenses, filters, expensive cameras outfitted with sharp-cutting anastigmat lenses and ground-glass focusing. Weather conditions often make photography impossible.

A third way, however—collecting in plaster—is quite satisfactory. True, it is limited to tracks that are located in mud, clay, or hard sand, but after all it is these places that the best sets of tracks are found. And the method is simple.

Just get some plaster of paris at your druggist's or hardware dealer. For mixing, a fruit jar will do, but see if your dentist won't order you a little rubber mixing bowl such as he uses. As the whole procedure consists merely of making a cast of the track, a form into which the plaster is poured will be necessary, but four small panes of glass pushed into the mud to form a rectangle around the track serves quite well. Drive them well into the mud and plug up the four corners. Stir your plaster and water together, adding plaster until the mix has the consistency of thick cream, then pour the mix into the mold slowly. It won't harden for quite some time. If possible, allow it to set overnight. If you are in a hurry, add table salt to the mix before pouring, and this will hasten the hardening.

After removing the cast, when hardened thoroughly, wash it to remove sand, mud and other accumulations. This is your negative cast. To get a positive cast, with the track imprinted into the plaster just as the original was imprinted in the mud, place your cast on a flat board, track side up. Apply several coats of shellac, lacquer, or clear varnish. When this has dried, get a heavy lather of soap and water on your hands and rub it over the surface of the negative. Again build your four walls around the cast, plugging the bottom edges and end with modeling clay or mud and pour in your mix to a thickness of about three-quarters of an inch. If you add asbestos powder the cast will have a tougher and more durable quality. Experience will teach you the proper amount to add. A small eyelet set into the top of the cast before it solidifies will enable you to hang it on the wall. The date of collection should be cut or scratched on the back when it has partially hardened.

COLORED PICTURES

Readers of Nature Magazine will, we are sure, be delighted to hear that we will resume, in the pages of Nature Magazine, the publication of the beautiful colored paintings of wild life by R. Bruce Horsfall. This will become effective in as early an issue as mechanical considerations allow;—probably with the June issue of this year.

A BLISTER BEETLE
This fellow has the characteristic chewing and biting mouthparts

THE BEETLE FAMILY

by C. F. Greeves-Carpenter

Photographs by Cornelia Clarke

Another article in the series on Breeding Insects as a Hobby

QUITE INTERESTING
The western twelve-spotted cucumber beetle is worth the study given him

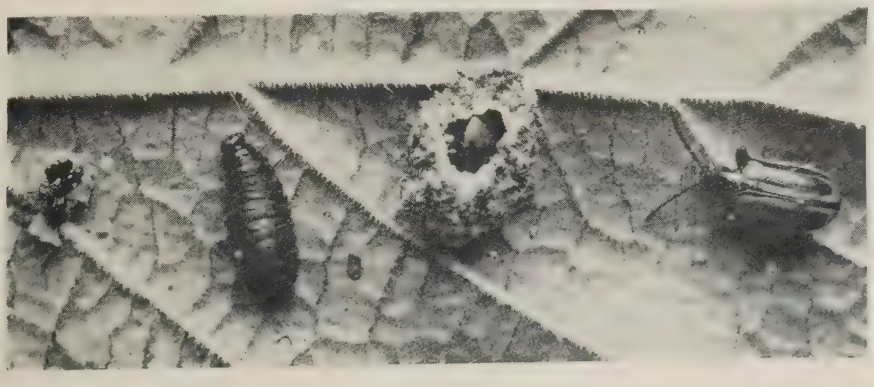
THE class Insecta is divided into a number of different orders. The average person is familiar with the order Lepidoptera of butterflies and moths, the order Orthoptera which includes cockroaches, earwigs, crickets, grasshoppers and a few other closely-allied insects, and the order Coleoptera or beetles. This last group contains about as many described members as all the other orders of insects put together and consists of approximately forty per cent of all the species in the animal kingdom. Its members can easily be recognized by the fact that they all have hard, leathery wing-covers or elytra which cover protectingly a pair of fine, membraneous wings, the organs of flight, and the abdomen. They all have biting and chewing mouthparts, and undergo a complete metamorphosis,—that is, they go through four distinct stages,—the egg, larval, pupal and adult stages.

In the control of beetles it is necessary to employ an insecticide that contains a stomach poison such as arsenate of lead, so the insects, in chewing or biting vegetation, will take the poison into their stomachs. If equipped with sucking mouthparts such an insecticide would not kill them if applied to the surface of the leaves, as their proboscis would pierce any such poison and the epidermis of the leaves before the sap of the plant would be imbibed. For this other type of insect, poison which clogs up the spiracles or breathing apparatus and causes suffocation must be used. Thus the importance of ascertaining the method of feeding before a control method can be intelligently applied is readily seen.

The majority of the beetles are plant feeders, and some, such as the ladybirds, are very beneficial, while others do not appear to be of any economic importance.

A search in a melon patch at any time from February onwards will undoubtedly reveal a number of green beetles, slightly resembling ladybirds. These will be the Diabrotica or cucumber beetles. A number should be captured and put in glass vials, and then taken home for an examination and close comparison. The specimens unlike the others should be placed in separate breeding cages, and the life-histories of them all recorded carefully. A number of sprigs of alfalfa or young beet plants should be planted in each cage, for the Diabrotica beetles are leaf-feeders, and appear to prefer these vegetables, and are partial to cucumbers.

The adults of different sub-species vary in their markings. One may have bright green elytra with twelve black spots; and with head, antennæ, legs and body of the same color. Its average length is about one-quarter inch. This specimen is the western twelve-spotted cucumber beetle, *Diabrotica soror* Leconte. Another, the twelve-

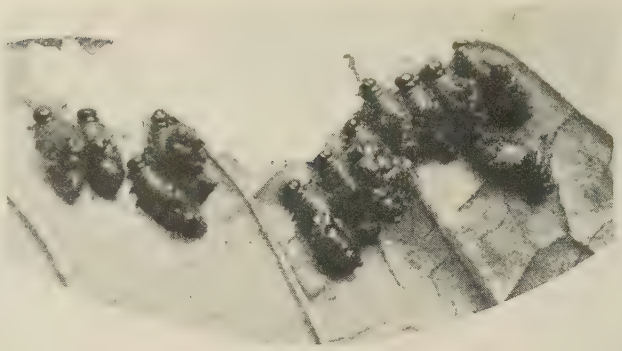


FROM EGG TO ADULT
Introducing the egg, larval, pupal and adult stages

SEE FOR YOURSELF
It is easy to make life-history studies of common insects

spotted cucumber beetle, *D. 12-punctata* Olivier, is slightly larger in size and the elytra are a paler green, though they display, likewise, twelve distinct black spots. In the case of the western variety, the spots are likely to be fused into one another, but this is seldom the case with *D. 12-punctata*. The head is black, and the body and first three joints of the antennæ are yellow. The obscure twelve-spotted cucumber beetle, or *D. 12-punctata tenella* Leconte, is similar in general appearance to the last described insect, but the wing-covers are of a dark shade of green, and the black spots may be faint and obscure or absent entirely. The head is either black or dark green, and the body, antennæ and legs are greenish yellow or brown. The western striped cucumber beetle, *D. trivittata* Mannerheim, is different from the others in that it is larger in size, and, instead of being spotted, has three longitudinal black stripes on its pale yellow elytra. The body is shiny black.

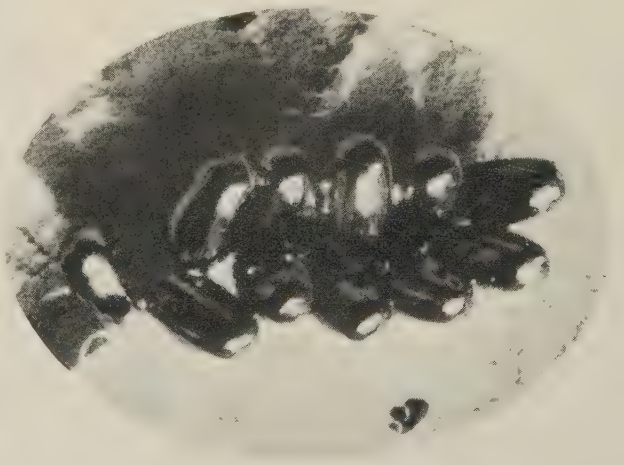
With the characteristics of leading species in mind, it will be quite simple to identify the insects captured, and it remains only to place them in the breeding cages, and to watch their manner of feeding and egg-laying. The females lay their eggs from March to May, depositing them about the bases of the plants to a depth of half an inch. The ova hatch into larvæ in about ten days' time. A larva will attack the roots of the plants, burrow a tunnel into the base, and, on becoming full-fed, or mature, will leave its tunnel and form a small cell in the earth in which to pupate. A few weeks later the imago, or perfect insect, will emerge.



BUSILY AT WORK

The larvæ destroy a leaf of the Chinese lantern plant, while preparing for the pupal stage

Virtue, in the field of ethics, is its own reward. Likewise, in the field of science, observations, though time-taking and requiring patience, bring their quantum of delight in the knowledge gained and the miracles of life seen. And to the scientific minded, the changes of a cucumber beetle are as wonderful as those which take place in the heavens. Just try this axiom out and see.



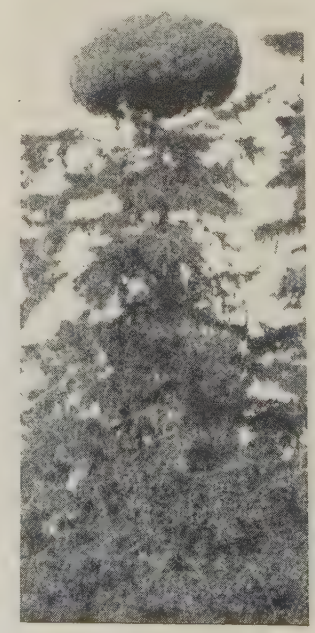
A CLUSTER OF EGGS

They are deposited from March to May near the bases of plants. These are enlarged fourteen times

So much for study's sake. But, as we have discovered, many beetles must be controlled, and the present species, with its relative, the striped cucumber beetle, engage in another way the earnest attention of the growers of cucumbers.

THE HEXENBESEN

by Leslie L. Haskin



I HAD been seeking these freakish growths among the foothill firs of Western Oregon, and had found them not uncommon. A farmer offered to show me where a "monstrous big one grew." He led me for nearly a mile up the mountain side and into a narrow canyon then out upon an abrupt point—and I fairly gasped with astonishment at what I saw. This was, indeed, a notable hexenbesen! Imagine a compact, closely clipped evergreen such as are commonly used to adorn conventional lawns. Have it a flattened sphere in form, eight or nine feet tall and about fifteen feet across—perfect and symmetrical in every aspect—but terminating the apex of a gigantic fir tree, one hundred feet or more tall. The stem upholding this aerial ball was, at its juncture with the main trunk, fully a foot through, and the bole of the tree at its base was at least five feet in diameter. Had its growth been normal this tree, no doubt, would have been much taller. I inquired of old residents in the neighborhood and found that this great ball had been in existence, apparently with but little if any change, for at least a generation. Small wonder that simple minds observing such an unusual tree should conclude that it was "hexed." What more natural than to think that some witch, for her own nefarious purposes, had blasted its growth.

Spanish Moss

A By-product of the Forests

by G. H. Lentz

Special Investigator, Louisiana Division of Forestry

PHOTOGRAPHS BY COURTESY OF THE U. S. FOREST SERVICE

AS THOUGH clad for some fête day, the hardwood and cypress forests of Louisiana's bottomlands are often festooned and bedecked with streamers of gray whiskers. These garlands of the forest are Spanish moss, or *Tillandsia,* and, while the trees on which this plant hangs and grows give it support, the host tree is not called upon for nourishment. Spanish moss is a true air plant and not a parasite.

"This most remarkable of all epiphytes," says Dr Schimper in an excellent description, "often completely covering the trees in tropical and sub-tropical America, consists of shoots often far more than a meter in length, thin as thread and with narrow grass-like leaves, and only in early youth fixed to the surface of the supporting plant by weak roots that soon dry up. The plants of *Tillandsia* owe their attachment to the fact that the basal parts of their axes twine round the twigs of the host. The dispersal of the plant takes place less by seed than by vegetative means, through the transport

BRINGING IN THE MOSS

(Below) A moss-bedecked live oak stand near the Gulf of Mexico

of severed shoots, by the agency of wind or of birds."

On the patriarchal cypress these festoons of moss seem to be the heaviest, and in some cases, are so dense that very little of the foliage of the tree can be seen. But this moss also occurs in great quantities on the hard-woods as well, and especially on the gums, live and water oaks, and pecans.

Aside from its aesthetic value the moss is of importance due to the rôle it plays as a harbinger of the cotton boll weevil, and in that it provides a merchantable product. The cotton planters would well be rid of the moss for in it many of the weevils spend the winter, and cotton fields lying adjacent to moss-draped timber are more heavily infested with the weevil. In a study carried on in southern Louisiana by the Bureau of Entomology of the U. S. Department of Agriculture, it was found that 365 weevils, on an average, wintered in a ton of moss. As yet no means of combating the weevil in its winter stage has been developed, and it is next to impossible to eradicate the moss.

The moss has a utilitarian value; it is collected on a commercial scale in many sections, particularly in the Louisiana parishes south of the Red River. There have been numerous cases where the moss rights on certain tracts of timber have been sold to moss pickers. In most cases, however, the moss is gathered on timberlands without any right having been obtained from the owner. The picking has been carried on by squatters, both white and negro, as their main occupation, while for others the income from the sale of moss has been only a side line. It has aided greatly many meager incomes.

FELLING A MATURE CYPRESS

Moss along the bayous and lakes in the Louisiana "Cajun" country

WEIGHING AND SELLING THE CURED MOSS
It must be thoroughly air dry at the time it is sold and is stored awaiting a market

The easiest method of collecting moss is for the pickers to follow behind a logging operation and pull the strands from the branches and tops that have been left. Often they become a nuisance to the woods foreman, because they are so anxious to get the moss from a certain tree that they will hardly wait for the sawyers to drop it. On one logging operation in central Louisiana the lumber company owning and cutting the timber has granted the pickers the moss rights in exchange for half of the final returns, the pickers to do all of the gathering and curing. In this particular case an old negro was granted the moss rights, and he had his entire family helping him gather the greenish gray moss from the fallen tops. An old dilapidated wagon and an ancient mule, equally dilapidated, made up his woods equipment. Three grown folks and three children gathered the moss, and with the aid of the mule and wagon, hauled in about a ton a day, the haul being about a mile; but the cost in time or labor seldom seems to enter into consideration.

In the "Cajun" country, or the parishes along the Teche River where the Acadian exiles from Nova Scotia took up their abode prior to the Revolutionary War, the "Cajun" woodsmen, fishermen, and trappers often collect moss during the closed season on hunting and trapping, or when other employment is not at hand. The country is a tangle of canals, lakes, rivers, and bayous, and these waterways take the place of roads. The region is subject to frequent overflows, and at such times, the moss is often gathered in a pirogue or bateau, and the high water enables the picker to reach well into the tree tops. A long slender pole with a metal hook attached at the end helps to pull down strands above ordinary reach.

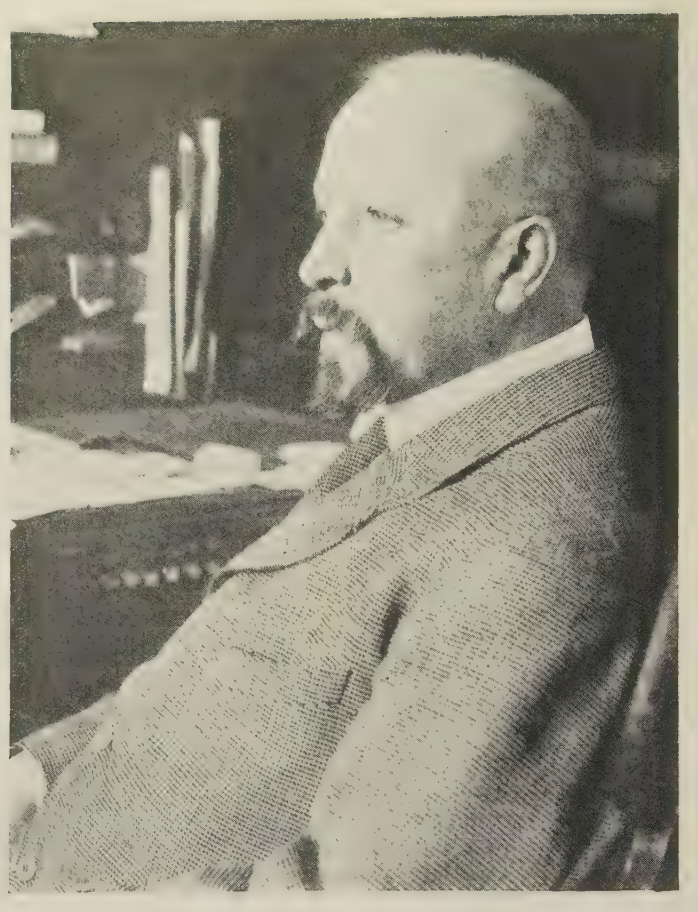
Moss that is still alive and growing is spoken of as green moss. On the same tree with green moss may be found strands of the partly cured moss, grayish-black in color. The usable part of the moss is the hard black center thread or fibre which looks like black horse hair. This strand is surrounded by a greenish-gray layer making the whole the thickness of an ordinary piece of string. The strands branch from time to time by sending out side shoots, and the various strands may then intertwine, forming a loose mass of many strands.

After the moss has been collected, it is carried either on a man's back, by boat, or by cart to a central point, usually the picker's shack, where it is cured. This curing process has for its object the removal of the outer layer of soft tissue so that only the black inner strand shall remain. The usual method of curing is to pile the moss in mounds six feet square and four feet high. It is piled when wet and a sort of fermentation and slow combustion takes place, causing the outer layer to rot off. After a month or so the mounds are re-piled in reverse order. Ordinarily, three months is sufficient time for complete curing. The moss is then hung on racks, fences, or any available support where it is exposed to the elements; the rain helps to wash away the loose outer tissue, and the sun dries and hardens the fibre.

Moss, after it has been gathered and cured, has lost about two-thirds of its original weight and bulk so that a ton of green moss yields only about 700 pounds of black moss. This is worth from two and a half to three cents per pound, on an average, and is usually sold to some gin operator who buys the moss from a large section of country. When they are properly cured, the strands are quite black and vary in length up to several feet. When not properly cured the fibre has a brownish-black color and has particles of the outer layer still adhering to it. The moss from cypress seems to yield the longest and blackest threads and is called "Black John"; it also commands the best price from the gin operator, possibly four to five cents per pound.

At the moss gin the cured moss goes through a sorting and cleaning process, sticks and trash are picked out by hand, the fibres are pulled apart and then fed into a machine or gin that further straightens out the fibres and removes the foreign particles. Finally, the cured clean moss is compressed and packed in bales of about 135 pounds each. During the cleaning process there is a loss of fifteen to twenty per cent due to the removal of trash and short broken fibres that are eliminated by the gin. The finished product, which is used for stuffing upholstered furniture, for auto seats, mattresses, and the like, brings from six to seven cents a pound to the gin operator.

This is just another minor forest product but one which is of considerable importance in the Mississippi delta and along the Atchafalaya River. The forest trees furnish the wood to make furniture and automobile bodies, and the moss goes to make them more comfortable.



DR. LELAND O. HOWARD IN HIS OFFICE

Beloved and honored entomologist who for half a century has studied the vast panorama of insect life

INSECT HUNTER

Dr. Leland O. Howard, Dean of Entomologists of the United States

by Alma Chesnut

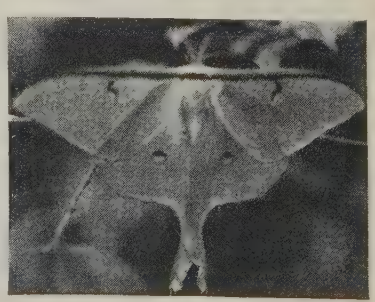
FIFTY MILLION years ago, even before the earth was encumbered by such strange animals as the glyptodon and sabre-toothed tiger, insects of many species lived among the lycopods and ferns and wriggled through the ooze. That was about 49,700,000 years before man appeared and the dawn of history began.

If a parade of the insects could be ordered today, between six and seven hundred thousand described species and from three to six million additional species, believed to exist in the world, would be represented in the line of march. The life habits of any one of these is likely to have an important bearing upon modern economic life, or to jeopardize public health, but almost nothing is known about them.

In a modest office in Washington there is a man who for more than half a century has surveyed and studied this vast panorama of insect life. The arch enemy of destructive insect hordes, he has wrested from them some of their secrets; for his work he is known and honored by many nations. To talk with him for an hour is to glimpse a new world, to visualize graphically the future struggle which, he predicts, must take place between man and the encroaching Lilliputian hosts.

Dr. Leland O. Howard, for thirty-three years chief of the Bureau of Entomology, United States Department of Agriculture, began to study insects at the mature age of six during a visit to an aunt on Long Island. He found a group of older boys collecting cocoons and heard from them the wonderful story of how the ugly caterpillar, swathed now in sombre shroud, would emerge in the spring as a beautiful winged creature. The little boy thrilled to the mystery of it and, when he returned to his home in Ithaca, took with him cocoons of the moth *Promethea*.

At ten came a hint of the personality of the scientist-to-be. He had founded a natural history society with a membership of about fifteen boys, some four or five years older than he. Leland Howard, then as now, possessed the happy faculty of contagious enthusiasm. The boys collected moths, butterflies and other insects, small animals, birds' eggs, shells and similar objects. They studied them, too. Young Leland's father, a lawyer, bought for him books such as *The Butterfly Hunters* and Packard's *Guide to*



LOVELY LUNA MOTH AND THE KATYDID

At the bottom of the page two of the many insects which lured Dr. Howard to his choice of life work

the Study of Insects. Professors at Cornell University were consulted by the boy naturalists for additional information and guidance.

"We used to go up to the meetings of the Cornell Natural History Society," Dr. Howard recalls with twinkling eyes, "and think, boy-like, how infinitely much better our gatherings were than theirs."

Leland stored his specimens in the drawers of old bureaus and later in glass-covered boxes of his own construction. By the time he was ready to enter college—and that was before he was sixteen—his collection included all of the butterflies that existed in his part of the country and practically all of the moths and grasshoppers. It was not a mean collection; in later years it was presented to Cornell and to posterity.

THIS is another article in the group, specially written for Nature Magazine, which tells of the achievements of the members of the Scientific Consulting Board of Nature Magazine. These are men whose names are written indelibly on the tables of accomplishment in the field to which they are giving their lives.

Among his most vivid recollections of early experiences insect hunting is that of the capture of his first Luna moth. All of the youngsters had been seeking it, for it is, perhaps, the most beautiful of moths found in the eastern states. Pale green in color, with trimmings of mauve, this fragile creature of the night seems aptly named for the moon. It is a large moth, about four inches across, with delicately trailing wings.

The boys had been in swimming when one of them shouted, "Luna! Luna!", and went chasing into the woods. Pandemonium reigned. By the time Leland had scrambled out of the water the hunt was well under way, but he found his small brother sitting unperturbed upon the bank. Beside the little fellow was his hat; under the hat was the Luna moth.

Dr. Howard matriculated at Cornell in 1873, intending to study medicine as his grandfather had before him. With this end in view, he took the full premedical course, receiving his B. S. degree, the first of many similar honors, in 1877. The following autumn he was to enter the New York College of Physicians and Surgeons. But during these years events were shaping that were destined to alter his whole career. The science of agricultural entomology was being born.

Three states, Missouri, New York and Illinois, were employing entomologists to study the ravages of insects upon crops and the Department of Agriculture, alarmed by the great losses reported from various sections, was mobilizing for a similar campaign more comprehensive in scope.

Dr. C. V. Riley, Missourian entomologist, had been brought to the Capital to initiate the work and was soon in need of an assistant. Having heard of the Cornell student and his enthusiasm for insect studies, he offered him the post. The boy accepted and, under Dr. Riley, helped found the Bureau of Entomology, an institution that saves the United States millions of dollars each year.

Dr. Howard's medical training fitted him for leadership in another field, equally important as agriculture. Intensely interested always in the part insects play in spreading disease, he became the apostle of medical entomology, accomplishing more perhaps than any other single person to promote cooperation between public health officials and trained entomologists in studies of the hundreds of insects known to carry specific diseases or to assist in spreading others. In 1904 he was made Consulting Entomologist of the United States Public Health Service. Fifteen years later he was appointed senior entomologist, with the grade of Senior Surgeon, of the Public Health Reserve.

Medical entomology, in spite of its progress during the last few decades, is an unexploited field, in the opinion of Dr. Howard. There are hundreds of insect species, closely allied to species known to carry disease, that should be studied. These, he says, include about 550 types of mosquitos in the Americas alone.

The entomologists and doctors exposed the house fly as the mechanical carrier of several diseases and have done much to safeguard the world against this criminal of the insect world. Dr. Howard was a leader in the campaign against it, publishing many bulletins and magazine articles, beginning in 1896 and culminating in his book, *The House Fly—Disease Carrier,* which appeared in 1911 and has since been translated into many languages. Extensive studies have been made of mosquitos, too, but, says Dr. Howard, we do not know all about them and further work is necessary. Typhus, malaria, yellow fever, sleeping sickness and Rocky Mountain fever are just a few of the maladies insects visit upon mankind. The tabulation of culprits covers some twenty-three fair-sized pages of book print.

Similarly, the field of agricultural entomology is immense. The human race has multiplied and spread so that today

LYNWOOD M. CHASE

THERE ARE MANY PICTURES OF RARE BEAUTY IN INSECTDOM
With no others of her offspring has Nature contrived so beautifully or so intricately

food must be provided in enormous quantities. In doing this man has created conditions peculiarly favorable to certain insects and these are multiplying more rapidly than ever, causing annual losses to agriculture amounting to about $2,000,000,000 in the United States alone.

Hundreds of offenders are catalogued at the Bureau of Entomology, and among these Dr. Howard selects as the most dangerous the cotton boll weevil, pink boll worm, Japanese beetle, gipsy moth, codling moth, plum curculio, corn borer, Hessian fly and chinch bug. Many of these were imported from other countries on foreign plants and are particularly destructive because the insects that preyed upon them are lacking in the new environment. One of Dr. Howard's tasks has been to direct a hunt for these insect enemies, or parasites, on foreign continents, so that they can be imported and set to work.

"Studies of insects have developed some effective control weapons," Dr. Howard states, "but in the long run we know very little about them. We do not understand many of the basic problems bound up in their lives; we do not even know exactly how they smell or see. And until everything about them is known, we cannot conduct an intelligent fight.

"The universities must teach more entomology in order to supply a much-needed army of trained investigators. Chemists, physicists and agronomists must cooperate in research. As matters stand, insects would soon do away with us entirely if they did not fight among themselves.

"With the exception of reasoning power, they are infinitely better equipped than we are for the biological struggle for survival. They have been on the planet millions of years longer and some species have changed very little during all those ages, presumably because they reached their high peak of efficiency long ago. Cockroaches, discovered in rocks of the Tertiary Period, are very similar to those of today.

"The insect has its skeleton on the outside and it protects its entire body. Neither alkalies nor dilute acid affect it, nor does it grow brittle with age. From the engineering viewpoint, this outer skeleton gives the insect limb three times the strength of the vertebrate. The horn-like covering, called chitin, not only protects the muscles but makes them function better. It is made of waste materials, available in a thousand substances, while man must pick and choose to include in his diet the proteins and inorganic materials of which human bones are made."

Furthermore, says Dr. Howard, the persistence of the insect race is aided by elimination of the periods of helpless infancy and old age. Insects never get old; they die in full vigor when their work is done. Nor is it likely they will ever suffer from a food shortage. Their miraculous ability to adapt themselves to all sorts of circumstances and environment is illustrated by the fact that there is hardly a known substance safe from attack. Old wood, garments, books, face powders, rugs, plants of all species and even petroleum, used as an insect poison, have as their destroyers certain insects.

The Bureau of Entomology tested its ability for practical work as early as the year 1879, by solving the problem of the clover midge which was attacking meadow crops in New York. It has devised ways to control the Argentine ant, one of the most destructive insects in the United States, and has concocted poison baits and sprays effective in limiting the ravages of hordes of other species.

Dr. Howard was one of the first persons to sense the menace of the cotton boll weevil, which has injured the cotton industry of the South. The country was adequately warned by him, when the weevil migrated from the mountains of Mexico to Brownsville, Texas. The plan to eradicate it was simple. Cotton growing was to be supressed for one or two years in the small areas then infested, thereby depriving the larvae of a food supply. The Texas legislature refused to pass a bill incorporating the suggestion and the world knows the result.

Many honors have come to Dr. Howard during his years of work. In 1923 he was named Chevalier of the Legion of Honor "for service to world agriculture", and, recently, he was given the rank of Officer. He is the only American member of the Academy of Agriculture of France and holds honorary memberships in many other foreign scientific societies. He has attended fourteen international Scientific Congresses, and presided at three of them.

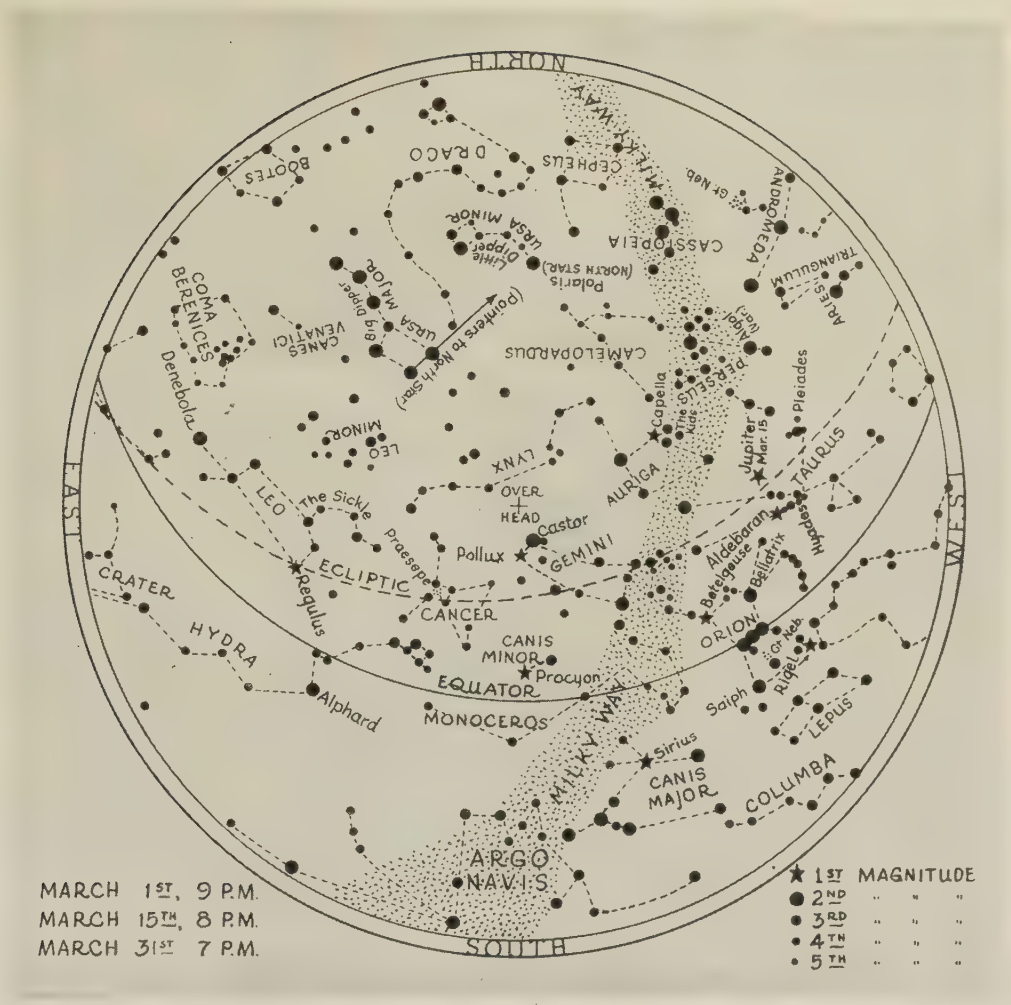
With other scientists he was called to the colors during the World War, serving as a member of the committee on agriculture of the Council of National Defense and as chairman of the sub-committee on Medical Entomology of the National Research Council. He holds the post of honorary curator of insects, of the National Museum and offices in numerous scientific societies.

Dr. Howard served the Bureau of Entomology as chief from 1894 to 1927, when he retired from this position at the age of seventy. He was continued in order that he might pursue his writings on entomological subjects. In 1931, he will be obliged to retire, and on a pension of but $1,000 a year. The thought of relinquishing his work at the bureau does not please him.

MISS CHESNUT, *who, in younger days, of course, has been bounced on the knees of several of the distinguished scientists and friends of her father's about whom she now writes, responded to our request for a little autobiography with the following, which we present unadorned:*

"I was born in Washington, D. C., the second child of scientific parents, and was raised on vitamins and calories. Upon graduation from Central High School my ambitions to engage immediately in war work, in the rôle of 'messenger girl' were forestalled by the aforementioned and horrified parents and I was sent to Goucher College, Baltimore, where I was graduated in 1922.

"While still in school I made excursions into journalism via the Baltimore American *and these excursions netted me my first position. As a reporter, I did the usual amount of fire-engine chasing, interviewing, rewriting, copy-reading et al. After four or more years of this, in a moment of mental weakness, I accepted a publicity position which I soon rejected to try free-lancing for magazines and newspaper syndicates, which work now engages my attention."*



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

Have You Seen An OCCULTATION?

How the Moon Hides Stars and Planets from Our View

by Isabel M. Lewis

TRAVELLING in a west to east direction, the moon passes each hour over an angular distance about equal to its own diameter and conceals from us the stars that lie in its path. During the twelve annual circuits of the heavens that the moon makes, this event takes place about two thousand times. Yet how many of us can recall such an occultation, as it is called?

For various reasons most of us have missed seeing these instances. Most of these occultations are of faint stars, the great majority being just beyond or near the limit of naked eye visibility. Such events, also, are visible only within a limited area and cannot be seen—unless the star or planet is exceptionally bright—when the moon is full, in daylight or twilight or when the moon is near the horizon. Then, too, many fine occultations have a way of happening about two or three in the morning when one's interest in astronomy might reasonably be expected to be at a low ebb.

Since the moon's path lies in that belt of the heavens known as the zodiac, it is only the stars in the zodiacal constellations that can be occulted by the moon. Among the first magnitude stars only Aldebaran, Pollux, Regulus, Spica and Antares can be occulted because they are the only stars of first magnitude in the zodiac. These stars and the planets Venus, Jupiter, Mars and Saturn furnish the most interesting occultations. An occultation of Venus or Jupiter by the moon is such a rare and impressive event that one would never regret getting up, if necessary, in the small hours of the morning to observe it.

An occultation will last, in extreme cases, about an hour and a half and it may last less than a minute. This

occurs when there is not much more than an apparent grazing contact of star and moon. When the moon passes through the Pleiades cluster several occultations will occur close together and it frequently happens that several occultations take place on the same day.

As the interested observer watches for the occultation to take place he notes that the moon is moving eastward with respect to the stars. Thus the disappearance of the star behind the moon or its immersion, as it is called, will take place at the *eastern* limb of the moon and its reappearance or emersion at the *western* limb. The disappearance of the star will take place with startling suddenness, one proof that the moon has no atmosphere, for an atmosphere would cause a gradual dimming of the star's light just before its disappearance. The reappearance of the star occurs with the same suddenness as its disappearance. In the case of a planet the two events do not occur quite so suddenly since the planet has a perceptible disk and it takes an appreciable interval of time for the moon to cover this disk completely.

Although, as we have said, something like two thousand occultations are listed each year, less than three hundred *different* stars are occulted. On successive months the moon returns very close to its previous paths and there is a considerable overlap of the regions covered on each circuit of the heavens. Thus the same star may be, and frequently is, occulted several times during the year; the same is true of the planets. For example, the planet Saturn may be occulted as many as ten times in a single year. Yet of all these ten occultations not a single one may be visible under favorable circumstances in any one locality.

Occultations are of very great value to the astronomer who is trying to solve the problem of the well-known irregularities in the motion of the moon that have proved to be so puzzling. In order to improve the tables upon which the prediction of the moon's positions in the heavens from day to day and hour to hour is based, and to test their accuracy, it is necessary to have a number of observations of the moon's true position in the heavens, and this is exactly what observations of occultations and also of eclipses give us. The positions of the stars are known to a very high degree of accuracy, and when the moon is occulting a star its position is then determined from that of the star with equal accuracy. A comparison of the predicted and true position of the moon at the time of the occultation shows how much the predicted place is in error. Observations of a large number of occultations are used to correct and improve its predicted places in its orbit.

One of the foremost astronomers of today working upon this problem of the moon's motion, Professor E. W. Brown of Yale University, whose Tables of the Moon are now so widely used in predicting the moon's position, has broadcast an appeal to amateur and professional astronomers to observe more occultations of stars and planets. As a result there is now a great revival of interest in all parts of the world in the observation of occultations. Such observations are very easily made since all one needs is an accurate timepiece and a knowledge of the approximate time when the occultation will begin and end. The observation of the accurate time of the disappearance or reappearance or both, if possible, is all that is needed.

In addition to the Elements of Occultations published in the *American Ephemeris,* the occultations that will be visible at Washington during the year are also published. In the present year there are over one hundred occultations visible at Washington, but about ninety of these are too faint to be visible without the aid of a telescope or opera glass. Of the remainder there are but two of special interest, one an occultation of a third magnitude star, Sigma Scorpii, in June, and the other a daytime occultation of Antares in October. In March there are nine occultations of stars but all of these stars are extremely faint, at, or beyond, the limit of visibility for unaided vision.

Among the planets this month Jupiter is still of special interest. It will be found in Taurus about five degrees nearly due north of Aldebaran. At the beginning of the month it will be a little to the west of the meridian at sunset. Mercury and Mars are in conjunction on March 1 in Capricornus and are too low in the southeast just before sunrise to be seen. Venus is now in the western evening sky, but is still too near the sun to be visible until late in the month. Then it may be seen near the western horizon immediately after sunset. Saturn is now in Sagittarius and rises in the southeast after midnight, and by the end of the month will be nearly due south at sunrise.

On March 21 at 3:30 a. m., eastern time, the sun will cross the equator coming north and spring will commence in the northern hemisphere.

The constellations of spring are now succeeding those of winter in the eastern half of the sky. The Sickle, in Leo, is high in the east. The head of Hydra, The Watersnake, lies directly south of Cancer and a few degrees due east of Procyon, The Little Dog-Star, which is on the meridian due south at 9:30 p. m. on March 1. The twins, Castor and Pollux, in Gemini, are also on the meridian at this time, nearly due north of Procyon. Sirius, The Dog-Star lies to the southwest of Procyon, and Orion is now far over in the southwest. Capella, Aldebaran, and Jupiter are conspicuous in the west and the brilliancy of the constellations now in the western sky, the groups of winter, which will soon be gone, is in marked contrast to the milder radiance of the stars of spring rising in the east. Get out your telescopes.

In May Nature Magazine will present the fourth geographic number which is the Upper Lake States number. Michigan, Wisconsin and Minnesota are the three states covered by this issue, which will be a worthy companion to the California, New England and Florida issues of earlier date. Four copies may be ordered in advance and sent to any four addresses for one dollar.

AUBURN

NEW SERIES for 1930

6-85—A SIX

120 inch Wheelbase

4 door closed car

$995

8-95—Straight EIGHT

125 inch Wheelbase

100 HORSEPOWER

4 door closed car

$1195

125—Straight EIGHT

130 inch Wheelbase

125 HORSEPOWER

4 door closed car

$1495

6-85 Sedan $1095; 6-85 Sport Sedan $995; 6-85 Cabriolet $1095; 8-95 Sedan $1295; 8-95 Sport Sedan $1195; 8-95 Phaeton Sedan $1395; 8-95 Cabriolet $1295; 125 Sedan $1595; 125 Sport Sedan $1495; 125 Phaeton Sedan $1695; 125 Cabriolet $1595.

Prices f. o. b. Auburn or Connerswille, Indiana

Equipment other than standard, extra

AUBURN AUTOMOBILE COMPANY, *Auburn, Indiana*

Airmail postage has been reduced to 5 cents for the first ounce and 10 cents for each additional ounce. Use Airmail daily for quicker communication. The development of aviation is vital to American progress.

THINGS to THINK ABOUT

A Page Devoted to Conservation from Varying Angles

West Coast Billboards

A remarkably successful contest was that of the Standard Oil Company of California, which sought to crystallize in word and picture material that would aid in the campaign for restoration of our highways to beauty through the elimination of marring outdoor advertising. There were four separate divisions to the contest. One sought the best essays on how the objectionable signs could be eliminated; the second sought essays on why they should be eliminated; the third asked for the best slogans for arousing public sentiment; and the fourth offered prizes for the best photographs showing actual defacement of the roadsides.

The first prize of $1,000 for the best essay on the prevention and elimination of objectionable signs went to Alwyn J. Baker of Berkeley, California, who presented a carefully thought out program of organization. Second prize went to Col. C. G. Thomson, Superintendent of Yosemite National Park, and the third to Wallace I. Hutchinson, U. S. Forest Service in San Francisco. Frederick Black of the Yosemite Park and Curry Company won the first prize for the best essay on why objectionable signs should be eliminated.

In the slogan division of the contest Ralph J. Rivers of Seattle carried away first prize with the slogan, "Why 'Sign' Away Beauty?". Arthur T. Ward of South Pasadena, California, took second place with "A Sign Removed is a Scene Improved." The third place was a tie between Henry J. C. Humphrey of San Diego and Esmer Saxton of Newport, Oregon, who had, respectively, the slogans, "Landmarks—Not Trademarks," and "Roadside Beauty—A Roadside Duty."

Prizes in the photographic division, which developed some startling pictorial testimony, went to Henry W. Cole, Port Angeles, Washington; Elmer Cunningham, Sacramento, California; B. G. Walker, Oakland, California; Dr. C. W. Benson, Los Angeles; Mrs. Dorothy Allen, Reno, Nevada, and Dr. Benson again with a fifth prize.

This contest has aroused widespread interest and discussion of the Pacific Coast. It reflects the wisdom of the Standard Oil Company of California in recognizing the public right to beautiful rural highways for which they pay. This company has removed its signs and now makes this added contribution to public education and interest in this stimulating contest.

The Woodcock's Journey

We note that the hunters are not satisfied that the woodcock is still on the game list, but are chafing under the restrictions imposed by the one-month open season and the four-a-day bag limit. The usual arguments, "still plentiful," "increasing," "no trouble to get the limit," "laws passed by swivel-chair Nature students," are being broadcast.

Such malcontents seem to forget that the woodcock is a migratory bird, and that the migratory bird law is for his benefit, not the hunter's. The flight that starts South with the October full moon must run the gauntlet of shot in many states. A woodcock raised in Quebec begins to hear the guns on the first of September. If he survives he may dodge shot in New York (and it will keep him busy) during October. In Ohio or Pennsylvania the guns will keep popping until mid-November. Farther south, say in Virginia, if his luck is still with him, he can hear them until mid-December. If he is still on the wing and keeps moving to the next tier of states, New Year's day marks his first legal respite from the leaden pellets. Then he may start North to try to raise a family to repeat this interesting, though hazardous experience. His little family will be about two.

During this four-months' fusillading our woodcock friend has never been in any state where he was in danger from shot for more than one month. But during his noisy trip from Quebec to Georgia what chance has he had to reflect on the good fortune that decrees that his open season shall last only thirty days? So this is civilization.

Sportsman and Farmer

Among the problems that are being seriously considered by those who have become alarmed by the realization that our game supply is dwindling is the "farmer". Most of the game now left is on his land. And the farmer is becoming more and more reluctant to allow sportsmen, by and large, to hunt over his property. Both the sportsman and the ammunition manufacturer have been studying this problem—from their own standpoints—and have concocted various plans to offset this condition. The farmer also has been studying the problem in his own way, mainly by observing the habits of the gunner, but he has seldom put the results of his study into print. We are gratified, therefore, to see that one farmer's wife has recorded some of the reasons that are behind this reluctance to open the farm land to shooting.

In "A Farm Woman Speaks", Mrs. Grace McCormac French of Carlton, Oregon, has recorded, under the auspices of the Oregon Federation of Women's Clubs and the Oregon Audubon Society, some experiences with hunters, who, having paid the state for a license, seem to assume that this carried the privilege of doing as they pleased on lands about the farmhouse. What they pleased included, in various instances, threatening and cursing the mothers and children, shooting so that shot or bullets hit the house, shooting the chickens, and setting dangerous fires. "Such things are not done by sportsmen," say the Game Commissions and the sportsmen's magazines. Quite true, but a man is known by the company he keeps and the real sportsman is often in bad company. We are glad that the farm woman is beginning to have her say. She and her husband have the right to enjoy in their own way, whether as game or as free wild life, the birds and animals that the farm supports. And we are glad that the women's clubs and the Audubon societies are helping to spread this point of view.

Save "Billy-Blue-Gum"

One of the most fascinating, lovable and interesting of the world's mammals is facing extinction. In his comparatively brief career with firearms as weapons, man has made remarkable strides in extinguishing beautiful and beneficial forms of wild life. Perhaps none of these, however, is as sad as the fate of the Koala, or Billy-Blue-Gum, as the native bear of Australia is known.

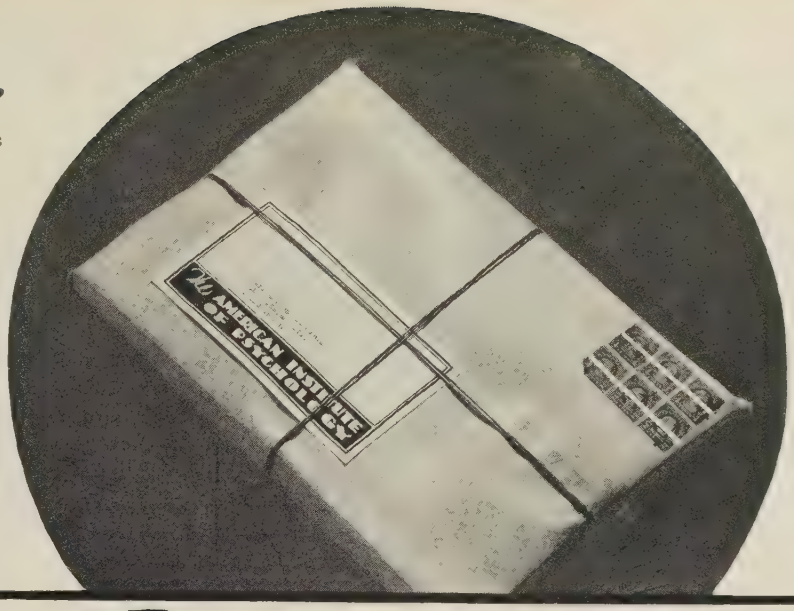
Indigenous to the three eastern states of Australia, this trusting little fellow is the one representative of his genus. It is a symbol of innocence, with its child-like expression of constant wonderment. Yet continual persecution has doomed the little mammal so that the only place where it is not rapidly disappearing is on two islands in Westernport Bay, Victoria. Queensland formerly boasted many of the bears, but in July, 1927, a terrible slaughter took place when the season was opened, and the official figures show that 584,738 of the bears were killed in one month, not to mention a probable loss of 200,000 babies that perished with their mothers.

The solution seems to lie in sanctuary, absolute protection and what amounts to propagation under ideal conditions. Investigation reveals that certain varieties of eucalyptus serve as food for the Koala, particularly the "Blue Gum" eucalyptus—whence the name Billy-Blue-Gum. The cutting off of these trees has further complicated the problem; so, also, has settlement. Under the leadership of Noel Burnet, "Koala", Moira Avenue, West Ryde, Sydney, Australia, a campaign is being made for the raising of funds to acquire a real sanctuary, properly stocked with fodder trees, for Billy-Blue-Gum. Help will be appreciated from any source. Perhaps some of our readers have met this charming little bear and will want to help preserve him for posterity by some gift.

Seek and Ye Shall Find"

Business or Professional Success
Beautiful Homes
Fine Automobiles
Love and Respect
Splendid Health
Charming Personality
Glorious Happiness

All these AND MORE *have been obtained easily through Christian Psychology*



Startling Lecture *NOW* Sent Free!

Tells the Complete, Amazing Facts About Christian Psychology and Its Astonishing Power of Quickly Bringing Wealth, Health and Happiness to Those Who Utilize This New, Remarkable and Simple System of Advanced Practical Psychology.

Arrangement has been made with the distinguished psychologist, author, teacher and jurist, Judge Daniel A. Simmons, whereby at least for a *limited time* you can obtain a complete manuscript copy, free and postpaid, of his marvelously interesting 6,000-word lecture, "The Kingdom of God." It explains the truly wonderful, soundly scientific facts of Christian psychology, an easily understood, simple system of advanced practical psychology that has performed seeming miracles in the lives of its students.

Send Coupon Immediately

Judge Simmons' own true life history is like a fairy story. Born in obscurity, he became and now is judge of the highest trial court of his state. For years struggling against bitter financial discouragement, he now possesses his own city and country homes and all that makes a happy, care-free life. Almost unknown in the early years of his professional life, he is now loved and respected by literally thousands of men and women in this and foreign countries whom his teachings have helped to success and happiness . . . and was selected by Psychology Magazine as one of the great masters of Psychology to lecture at its educational conference at Lookout Mountain. Ridiculed and vilified only a score of years ago for his radically different and astounding lectures, magazine articles and books on practical psychology, he is today blessed by doctors, lawyers, ministers, merchants, artists, teachers, farmers, housewives and others in practically every walk of life who have obtained through his teachings the greatest desires of their hearts.

Thousands, who know of Judge Simmons and his work, have already sent for this, his latest lecture. Be sure to send the attached coupon while a copy can be sent to you promptly and *free of charge.*

Solves Vital Problems

Christian Psychology is Judge Simmons' latest and by far his greatest scientific work in behalf of perplexed, speed-ridden, discontented mankind. This is a strong statement in view of the huge mass of documentary evidence of what Judge Simmons' vital teachings have accomplished in the past. Nevertheless, it is a *correct* statement, for Christian Psychology is the culmination of his years of psychological study and is the first logical, scientific and successful solution of the burning desire of every man and woman, of whatever religious belief or *disbelief,* for the power to be the god of his or her own fate on this earth.

Not a Religion

Christian Psychology is soundly scientific and essentially practical. It is sensible, simple to understand and quickly profitable to use. It is not a religion. Neither does it in any way conflict with the work of any church. It is called "Christian Psychology" because it was Jesus of Nazareth, whether you regard Him as the Christ or merely as a superman, who first revealed certain scientifically correct and proven psychological keys that unlock the doors to *all* the physical and spiritual splendors of life—all of those physical things and conditions and mental triumphs and happiness that will make for you a Kingdom of Heaven right *here* and *now* on this earth!

No Cost Now or Later

This is your fortunate opportunity to obtain, without the slightest charge or other obligation, "The Kingdom of God" lecture explaining Christian Psychology and how it is successfully used. Be assured that no salesman will *ever* call upon you in response to your request for Judge Simmons' breathlessly interesting lecture. It is sent you *entirely free* in order that you may truly understand what Christian Psychology is, and can demonstrate to your own satisfaction what it actually *will do for you.*

Whatever you seek in life, whatever you desire for yourself or those you love, take this most important step to obtain it by mailing the attached "No Cost Coupon" right *now.* The lecture will be sent you promptly upon receipt of your request—but get the coupon into the very next mail.

THE AMERICAN INSTITUTE OF PSYCHOLOGY
2703 Law Exchange Bldg. Jacksonville, Fla.

JUDGE SIMMONS
author of "Kingdom of God"

NO COST COUPON

THE AMERICAN INSTITUTE OF PSYCHOLOGY,
2703 Law Exchange Bldg., Jacksonville, Fla.

Please send me free, postpaid and without any obligation upon my part Judge Daniel A. Simmons' complete, 6,000-word lecture, "The Kingdom of God," revealing astonishing truths of Christian Psychology that enable people to actually make their wishes come true.

NAME .....

STREET .....

CITY ..... STATE....

WILD ROSE WINS

(Continued from page 149)

icant part in achieving the result. We acknowledge and express our sincere appreciation for their efforts, and for the cooperation of a great many individuals who became efficient and active workers.

A million votes probably represent as large a proportion of Nature lovers as do the totals in a presidential election in representing the grand total of eligible voters. And even if this statement is not sufficiently conservative, the efficacy of "straw" votes in showing the true opinion of the people has been proved in several national elections by the *Literary Digest*. It is significant that the proportionate vote cast for the leading candidates varied little after the 100,000-ballot mark had been passed, except in the last days, when the columbine, under impetus given by the Columbine Society, temporarily spurted. The effect of the school vote was negligible. If it were entirely disregarded, the wild rose would still be ahead.

The wild rose, despite criticism to this effect, is not the flower of England; her emblem is the cultivated rose. The campaign did not designate one particular variety of wild rose, but left it possible for each community to feel that its local representative of the genus was the people's choice.

Many interesting facts may be discovered by a study of the table below. Pennsylvania, with 111,256 votes, Ohio, with 78,648, New York with 63,835, and Wisconsin, with 59,779, led the country in number of ballots cast. Washington supported the columbine more vigorously than any other state. But seven votes separated the rose and its rival in South Dakota. More than six thousand people, Americans living outside the forty-eight states, are represented in the "No State" column.

It has been a good contest. The supporters of the columbine may feel confident that their flower stands second, at least, in the public esteem. And the wild rose, if Congress follows the commands of the electorate, will fill a void, that has never been filled.

	WILD ROSE	COLUMBINE	VIOLET	GOLDENROD	PHLOX	AM. BEAUTY ROSE	DAISY	MT. LAUREL	DOGWOOD	SCATTERING	TOTALS
ALA.	10,814	827	1,918	3,496	3,517	535	591	182	822	758	23,460
ARIZ.	1,020	524	124	154	71	28	5	15	21	113	2,075
ARK.	1,933	86	265	376	90	97	339	12	148	1,240	4,586
CALIF.	14,597	8,091	3,293	2,892	3	452	19	18	201	955	30,521
COLO.	4,767	5,474	275	637	81	706	14	1	17	501	12,473
CONN.	5,886	3,756	535	1,797	160	391	151	993	120	787	14,576
DEL.	739	203	198	15		20				143	1,318
D. C.	3,514	955	589	259	532	84	64	249	1,527	478	8,251
FLA.	4,176	27,422	653	734	99	24	16	24	36	45	33,229
GA.	5,704	234	1,106	4,086	2,089	174	1,966	2,426	123	257	18,165
IDAHO	2,526	525	357	439	149	214	36	20	36	361	4,663
ILL.	20,160	23,114	4,205	3,927	753	2,060	435	143	300	1,779	56,876
IND.	10,040	5,765	2,037	1,664	692	767	325	9	36	1,009	22,335
IOWA	26,250	6,858	3,340	3,011	1,406	556	325	102	48	846	42,742
KANS.	6,602	794	578	1,204	320	348	57	4	7	269	10,183
KY.	3,736	737	832	2,318	1,004	417	325	324	165	644	10,502
LA.	3,197	110	231	266	304	24	122	319	11	75	4,659
MAINE	6,393	964	735	1,485	159	101	35	96	4	107	10,079
MD.	1,758	871	453	285	104	112	12	30	59	1,205	4,889
MASS.	4,890	4,962	787	632	241	200	265	278	2	546	12,803
MICH.	22,392	7,026	4,445	3,166	1,427	978	445	104	491	900	41,374
MINN.	11,949	18,891	7,896	994	928	666	115	7	22	518	41,986
MISS.	4,611	179	1,305	2,421	123	496	552	31	286	378	10,382
MO.	15,376	3,771	3,131	2,348	619	1,130	601	33	44	1,433	28,486
MONT.	5,466	1,217	418	677	163	438	43	13	4	244	8,683
NEB.	3,301	635	348	1,530	166	486	233	15	26	536	7,276
NEV.	524	124	33	131	19	64	97	2	23	24	1,041
N. H.	1,006	528	236	374	35	36	6	17		65	2,303
N. J.	11,783	9,473	3,507	1,734	1,405	1,849	719	1,427	188	1,445	33,530
N. MEX.	673	142	121	146	30	218	15			85	1,430
N. Y.	26,224	21,003	4,972	2,561	1,254	2,705	1,470	1,202	277	2,167	63,835
N. C.	5,430	2,296	1,765	2,128	493	167	323	152	75	720	13,549
N. D.	23,637	7,172	1,197	3,356	393	43	72	36	31	637	36,574
OHIO	33,361	15,742	9,054	9,195	3,489	3,084	706	598	1,077	2,342	78,648
OKLA.	2,956	695	1,401	842	680	297	287	12	75	304	7,549
ORE.	7,138	1,206	1,062	1,243	376	952	77	24	125	169	12,372
PA.	69,575	17,814	10,201	4,537	2,269	1,668	593	2,045	854	1,700	111,256
R. I.	735	340	391	61	50	158	9	136	7	33	1,920
S. C.	1,383	169	384	492	70	460	22	11	26	38	3,055
S. D.	2,370	2,363	275	304	72	166	10			173	5,733
TENN.	15,197	2,208	161	2,881	126	339	3,432	23	28	135	24,530
TEXAS	13,086	1,410	3,292	4,209	1,832	3,101	692	38	156	1,624	29,440
UTAH	2,148	1,501	48	274	38	11	1	2		24	4,047
VT.	1,140	1,440	68	229	160	43	24	12	8	220	3,344
VA.	4,312	2,148	478	1,836	250	171	40	586	825	172	10,818
WASH.	8,191	35,066	3,323	1,551	193	120	110	220	75	516	49,365
W. VA.	6,177	2,394	1,207	1,726	169	1,892	283	895	556	841	16,140
WISC.	30,629	6,267	12,855	3,042	2,190	1,103	746	178	55	2,714	59,779
WYO.	22,405	846	270	407	133	78	30	7	3	189	24,368
NO STATE	934	5,113	48	40	16	253	14	11	4	45	6,478
TOTALS	492,811	261,451	96,403	84,112	30,942	30,482	16,860	13,082	9,024	32,509	
GRAND TOTAL											1,067,676

PLANTING THE GARDEN, MONTH BY MONTH

By ROMAINE B. WARE

JUST as soon as the frost is out of the ground, actual outdoor planting may be started. The first material that should receive attention is shrubs. This work naturally divides itself into two parts, the planting of the new shrubs which should if possible be dormant and the transplanting of old shrubs that we for some reason or other want in different places. The latter group needs attention first.

Many a garden or yard contains shrubs of various sizes that are planted in the wrong place. The owner realizes the fact but for some unknown reason fails to move them. It is comparatively simple to do this but there seems to be a fear that they will not live if moved. Practically any shrub may be moved if the right method is pursued. Rhododendrons and a few other things are somewhat difficult but even these can be moved if care is used. Rhododendrons should not be moved at this time however.

All deciduous shrubs, those that lose

"Consider the Lilies"

Lilium auratum

Lilium regale

HARDY LILIES, planted among other plants in the Hardy Border help to glorify it and maintain a colorful display from early summer until Fall. They are friendly creatures, almost human in their appeal to the senses of mankind, creating surroundings in which he may live a better life in a more beautiful world. They are always among the first choice of professional gardeners and enthusiastic amateurs, and it is their enthusiasm and support that has encouraged us in our work of the past 10 years in seeking the lost or unknown Lilies that are indigenous to unexplored regions of the Orient.

Our Special Spring Planting Collection

will bloom from June until September

3 Lilium Auratum 3 Lilium Elegans 3 Lilium Tigrinum
3 Lilium Regale 3 Lilium Speciosum Rubrum

15 bulbs in all, list value $7.20. Sent prepaid with our Lily Book for $6.00. (A total value of $8.20 for $6.00)

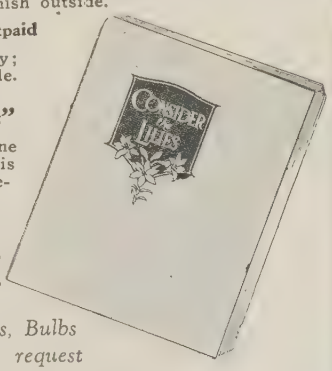
THE STATELY REGAL LILY. For those who cannot use the above entire collection, we suggest the Regal Lily (Lilium Regale) as a most desirable and extremely hardy garden variety; fragrant white flowers, brownish outside.

3 Flowering bulbs for $1.20 or 6 for $2.00 postpaid

All the above are now ready for immediate delivery; plant in early spring as soon as ground is workable.

Our beautiful book "Consider the Lilies"

Accepted by the world's greatest horticulturists as one of the most authentic and interesting treatises on this great and important Hardy Floral Family. Over 80 reproductions in natural colors; over 100 varieties fully described with growing directions.



Postpaid $1.00 or free with above collection or any order for Lilies amounting to $3.00 or over

Our general catalogue of Seeds, Bulbs and Plants mailed free upon request

W. E. Marshall & Co., Inc.

156 West 23d Street, New York City

Rock-Garden Building Is a Fascinating Task

A rock-garden puts no limit on the designer's skill. Plants may be grouped by color, by size, or by blooming-time. Pleasing results are sure.

"Alpine Plants"

our catalogue, lists hundreds of rock-garden plants, grouped to make selection easy. Planning, building, and planting the rockery are covered in a clear way. Send for a copy of the booklet.

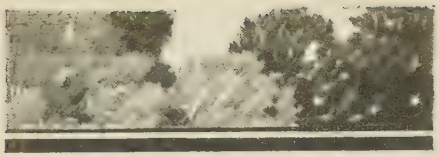
BUSKIRK'S
Independence Nurseries
Box 31, Independence, Ohio

Trade Mark Registered

SAFEGUARD your beautiful plants, flowers and shrubs from destructive insects. Spray them regularly with Wilson's O. K. Plant Spray . . . the nationally recognized standard insecticide . . . the insects will disappear and your plants will prosper. Andrew Wilson products may be obtained at leading stores everywhere . . . write us, if your dealer cannot supply your requirements. Recommended by the Officers of The Garden Club of America. Halfpint 40c; Quart $1.00; Gallon $3.00; 5 Gallons $12.00; 10 Gallons $20.00.

FOR SALE BY ALL DEALERS
Also Manufacturers of
WILSON'S WEED KILLER
The Modern Way to Kill Weeds
WILSON'S RHODY LIFE
For Rhododendrons

Andrew Wilson Inc.
Dept. V3
SPRINGFIELD, NEW JERSEY



A WATER LILY POOL *for your garden* ~ ~ ~

NEW beauty, gorgeous new colors, exquisite fragrance and fascinating new interest may be added to your garden by addition of a Water Lily Pool.

In every garden, large or small, there is room for a Water Lily Pool, or at least a simple tub garden. Marvelously beautiful effects can be achieved quickly and with little effort or expense.

You can enjoy a Water Lily Pool this summer if you will plan now. No garden is modern without one.

"Gems of Color" Collection—$5
Three exquisite Water Lilies. Chromatella (rich yellow); Pink Opal (a lovely pink); Blue Beauty (immense flowers of rare, deep blue). All three for $5

Egyptian Water Garden—$7.50
Includes beautiful pink Sacred Lotus of the Nile; two Egyptian Water Lilies of blue and white; Ancient Papyrus and 16 assorted Aquatic Plants. All for $7.50

Illustrated Catalog Free

Shows you how to construct a pool or plant a tub garden. Describes our immense collection of Water Lilies and Aquatic plants. Many illustrated in natural colors. Gives cultural directions. Write for Free copy.

Collection of 2 calico fishes; 4 Mosquito Killers; tadpoles, snails; salamander; clam, turtle; shipping can. All for $3

Wm. Tricker Inc.
302 Brookside Avenue — *Waterlilies* — Saddle River New Jersey

their leaves in the fall and leaf out again in the spring, may be moved now. If possible it should be done before the leaves burst forth. The setback is much less then. When you move an established shrub, you destroy more or less of the feeding rootlets and this is the main cause of damage to the plant. If it were possible to dig a shrub with a sufficiently large ball of soil so that all the roots were contained within it, the plant would hardly know it had been moved. Generally this is impossible except with shrubs that are small or have only been in place a year or two. Older, established shrubs have extended their roots far and deep and when you dig them up, many, especially the fine feeding rootlets, are destroyed. This means that the plant will be undernourished till new growth re-establishes the balance between root and top.

Right here is one of the important points in the moving of an established shrub. If the feeding rootlets are destroyed a sufficient amount of the top growth should be pruned away to maintain a balance with the ability of the roots to supply food and moisture. This is very simple to do but so many times it is neglected and the plant has to struggle for several months with nature allowing part of the top to die in its attempt to even things up. Whereas if intelligent pruning is done at moving time the plant is in shape to go right at the work of growing new rootlets and top growth. Just how much of the top to cut off will depend upon how much of the root system is destroyed. As a general rule, about one-third should be removed. Cut out all weak or diseased branches and shorten back the rest of the top. Don't be afraid to cut as you are assisting nature rather than thwarting her desires. Use a sharp pair of pruning shears and make all cuts good and clean, always just above a bud that growth may be active and heal the wound. Cutting too far above a bud, thus leaving a stub to die, may result in rot and disease getting started.

The planting of new shrubs may be done at any time from as soon as the frost is out of the ground and as long as dormant stock is available. Dormant stock is that which has been dug and heeled in, generally in a storage cellar with just the right temperature and moisture conditions to prevent growth and still keep them from drying out. There is a great difference in the quality of dormant stock for this reason and it does not pay to plant inferior stock. Sometimes one sees shrubs offered for sale that have white shoots on them two or three inches long. These are poor stuff as much of their strength has been lost in formation of these premature growths. Shrubs of this kind will have to be pruned back severely if they are to take hold right.

Even dormant shrubs that have been handled with the best of care must be pruned back at planting time. No matter how carefully they have been grown and dug, some of the rootlets will be lost and even with the best of storage conditions they will dry out to some extent. At least one-quarter of the top and sometimes one-third, will have to be cut away. Then they will be able to start vigorous growth at once. If the top is not cut back it will dry out more or less before the roots start supplying moisture and future growth will be retarded. If you are afraid to cut them back, try it upon one shrub in a group and

The **Storrs & Harrison Co's 1930 Spring Catalog**

JUST off the press—the beautiful new catalog of America's Oldest and Largest Departmental Nursery. More color illustrations; more new charts and diagrams; a complete listing of common and uncommon trees, plants, shrubs, vines, seeds, etc. Easy-to-follow instructions on how to plan and plant an Outdoor Living Room or Rock Garden.

Write Today for Free Copy

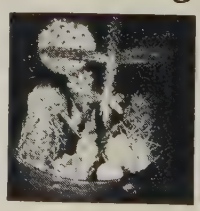
THE STORRS & HARRISON CO.
Box 129 **Painesville, Ohio**

Star Roses

When you plant "Star" Roses you do so with utmost assurance that they will grow and bloom. Every plant is trademarked and *guaranteed* to bloom. Grown by rose specialists, with over 30 years successful rose growing experience. Our 1930 "Star Guide" describes over 200 up-to-date varieties—46 shown in natural colors. If you want dependable roses, send for your copy of "Star Guide to Good Roses" today.

***The* CONARD-PYLE CO.**
Robert Pyle, Pres.
Star Rose Growers
Box 28 **West Grove, Pa.**

Blooming Size CACTI



Group of 25 named varieties for sun room, porch, or garden—if ordered individually would cost $14—a quality bargain buy at..... $7.
10 different named varieties with hand painted Mexican bowl. $4.
Same without the bowl $3.
5 different blooming size named varieties with Mexican bowl..... $2.50
Same without the bowl $1.50
Cacti culture book free with orders. Shipments prepaid. Send check, stamps, money order.

MEXICAN TRADING CO., Room E.
Two Republican Bldg. **El Paso, Tex.**

World's Largest Dahlia Grower

Send today for my Free large Catalogue on Dahlias, Glads, Iris, Peonies, Phlox, Flowering Shrubs and Perennials.

J. K. ALEXANDER
(The Dahlia King)
107 Central St., E. Bridgewater, Mass.

HENDERSON'S SPECIAL OFFER

IF you will send us 10 cents, and mention where you saw this advertisement, we will mail you Henderson's new catalogue, "EVERYTHING FOR THE GARDEN," and the new Henderson 25¢ Rebate Slip.

Every Rebate Slip Counts as Cash

The Henderson Rebate Slip, when returned to us, will be accepted as 25c cash payment on any order of Two Dollars or over. In addition, we will include with your order, without charge, our Henderson Specialty Collection of six of our best known introductions:

One packet each of Ponderosa Tomato, Big Boston Lettuce, Early Scarlet Turnip Radish, Invincible Asters, Brilliant Mixture Poppies, and Giant Waved Spencer Sweet Peas.

"Everything For The Garden"

is the title of our annual catalogue. For 1930, it is a book of 208 pages, with 16 beautiful color plates, 192 pages of rotogravure in various colors, and over one thousand illustrations direct from actual photographs of results from Henderson's seeds—the finest and most complete catalogue we ever issued.

PETER HENDERSON & CO.
35 CORTLANDT ST. NEW YORK

Grow GLADS

MAKE your garden the envy of your friends with Gove's Hardy Vermont Glads. Best of garden cut flowers —very easy to grow. Our special "get acquainted" offers will make you an enthusiastic "glad fan". Bulbs guaranteed to bloom first year.

100 Large Hardy Vermont Bulbs $3

This collection includes at least 35 fine varieties, in many shades of Red, Yellow, Pink, Blue, Orange, Smoke, White, all good ones but not labeled as to name. **50 for $1.75.** *All sent prepaid* with complete instructions for growing prize-winners. I believe this to be the finest "glad" collection offered anywhere.

Specialty Collection

Annie Laurie, exquisite ruffled Pink; **Emile Aubrun,** large bronze; **Apricot Glow,** beautiful Apricot-colored; **Golden Dream,** finest clear yellow; **Marnia,** very large Orange. All five rare varieties—labeled, $1. (regular $1.50 value). **Both collections prepaid, for $3.85. Send for illustrated catalog "that is different", listing over 300 of the world's best varieties.**

5 BEAUTIFUL RARE VARIETIES $1 $1.50 VALUE

Champlain View Gardens
Elmer E. Gove Box 62 Burlington, Vermont

DAHLIAS

Look for the Trade Mark when looking for quality

For more than 40 years this Trade Mark has stood for quality and fair dealing. Stock true to name and free from disease. 1930 introductions, novelties and standard varieties. Catalog (36 pages) free.

W. W. WILMORE Box 382 Denver, Colorado

EVERGREEN SHRUBS Rhododendron and Mountain Laurel 2 to 4 ft. 25—$6., 100—$20. Hemlock 2 to 4 ft. 25—$6., 100—$20. Fancy Holly 2-4 ft. 25—$8. Write for our wholesale price list.
Forest Evergreen Co. Box 29 Doeville, Tenn.

you will soon be convinced by the way they take hold.

In planting shrubs, the soil preparation is important. If you do not make the soil fine so that it can contact all the little fine rootlets they will be left to perish in the air pockets between the particles of soil. Fine soil must be worked in around the roots, especially if there are masses of fine feeding rootlets. If in contact with soil as nature intended, they are immediately ready to start supplying food and moisture to the stems and branches. Then leaf growth may start as it should.

The planting of evergreens is even easier than deciduous shrubs as invariably they are dug with balls of earth. Never purchase evergreen without a ball of earth to protect the roots from the air. If the roots are exposed even for a few minutes the sap in them will harden, being of a resinous nature and once it hardens the plant will promptly die. Dig the hole large enough for the ball of earth and plant it firmly. Set it not more than an inch deeper than it was in the nursery. Deep planting is fatal to nearly every kind of shrub or evergreen.

In the planting of deciduous shrubs dig your hole large enough to spread the roots naturally. Don't crowd and twist them to get them covered up. The hole should be large enough to lay them out as nature grew them. It will then be in shape to extend its roots in an ever widening circle. Twisted cramped roots cannot grow naturally and the shrub is retarded in its growth.

Do not mound up the soil around a shrub. Keep the surface level or even slightly depressed around the plants. Water will then sink down to the roots rather than run off as it is wont to do from a mound of soil. At planting time water thoroughly so that the rootlets have plenty of moisture to revive their partially dried condition. Plenty of water also aids in settling the soil around the roots and in making contact with them.

Fine dry soil over the surface or a mulch of some kind will aid in keeping the soil around the roots moist and help the plant start growth. Be sure that new planted shrubs and evergreens do not want for water. They do not need to be kept in a pool of water but they should have some moisture available at all times. If they are allowed to suffer for water just at this time they seldom if ever fully recover.

In planting deciduous hedges they must be pruned back even more severely than ordinary shrubs as not only must you make up for loss of roots but you wish to force the growth of new branches down at the base of the plants. If not pruned back severely the growth will be at the top and the hedge will never make base growth. This is the reason so many hedges in all sections of the country are thin and scraggly at the base. The planting or transplanting of all kinds of shrubs is comparatively simple but careful attention to these little details will spell the difference between success and failure.

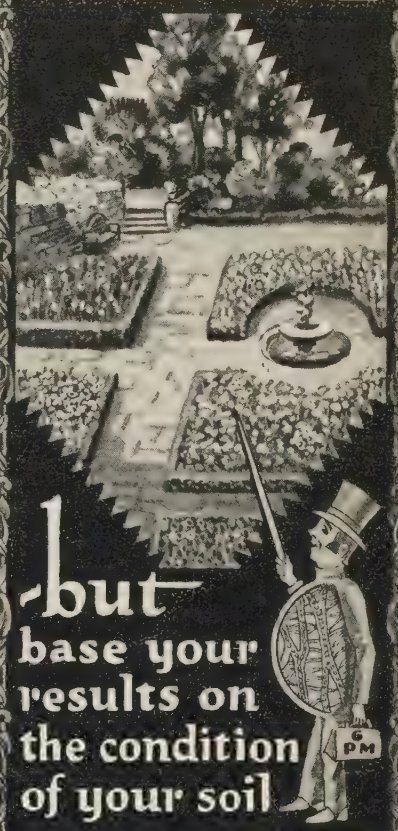
California Grown **WATER LILIES**

Marliac Trio Our Special Assortment of colors White, Yellow and Pink. **$3.00 Postpaid**

Now is the time to plan for a water lily garden. All shipments guaranteed for safe arrival. WRITE FOR FREE CATALOGUE.

LONG BEACH WATER GARDENS
Box 928N Long Beach, California

Plan Now



-but base your results on the condition of your soil

JUST remember this—to begin with, your garden is soil . . . only soil . . . and the manner in which you prepare that soil will positively determine how well satisfied you will be with the plants you grow.

Plants cannot move around to secure their food and drink, so the soil in which they grow must *attract* and *store* sufficient for their needs.

In their efforts to produce this soil condition, people often overfertilize when they should *properly condition* the soil—make it physically correct.

Soil that is too largely sand, or too predominately clay, or garden loam that lacks organic matter and humus, is not in the right condition to produce good results.

Let us tell you more about this necessary basic starting point in our free descriptive literature. Small sample bale (about 2 bushels) $1.50 postpaid.

A little Pioneer G P M Peat Moss dug into the soil like manure, *each season,* will keep it in healthy condition and produce better blooms.

ATKINS & DURBROW Inc.
E-25 Burling Slip
New York, N. Y.

G P M
PEAT MOSS
REG. U.S. PAT. OFF.

BOBBINK & ATKINS

Ask for Catalog

World's Choicest Nursery & Greenhouse Products Grown In America

Visit Nursery

ROSES—Spring Planting

Several hundred thousand, two-year-old, low-budded, field-grown plants, in several hundred varieties, are ready for shipment at the proper season. Many are new and rare; among them are **Mrs. G. A. Van Rossem, Lady Margaret Stewart, President Herbert Hoover, Everest** the largest white rose, and the well known **Etoile de Hollande** in the Hybrid Teas group. **Thelma** one of the new dainty Pink Climbers, and many others. Also the wonderful Hybrid Perpetual **Arrillega.**

"Roses by Bobbink & Atkins," our special catalog, is profusely illustrated in color, describing and pricing the older favorite Roses as well as the newest novelties. Intelligent comments are given on the merits and demerits of the various varieties. All are classified and arranged to assist you in making a perfect selection. A copy will be sent to those who intend to plant Roses.

Hardy Herbaceous Plants

A complete catalog of new and old-fashioned flowers, Hardy Chrysanthemums, Delphiniums, Marshmallows, Peonies, Iris, Phlox, Poppies, Rock Garden Plants in large variety. Beautifully illustrated. A table indicating Flowering Period, Height and Color is a feature.

Evergreens

An illustrated catalog of Coniferous Evergreens, Evergreen Shrubs, Deciduous Trees, Flowering Shrubs, and Trees, Hedge Plants, Hardy Vines, and conservatory plants.

Our Specialties

Azalea Mollis and Pontica, Hardy Evergreen Azaleas, Chinese Magnolias, Cotoneasters, Japanese Maples, Rhododendrons, and Blue Spruce, grafted, Koster and Moerheimi varieties.

In your request for Catalog it is important to state definitely what you intend to plant, as we issue several catalogs.

BOBBINK & ATKINS

Nurserymen and Florists **Rutherford, New Jersey**

You will confer a favor on us by mentioning this magazine

New! Duckham's Delphiniums

NEW COLORS NEW TYPES-MASSIVE SPIKES

The latest productions in Giant Delphiniums from my famous Madison Gardens (to use the terms applied by many experts who saw them in bloom last summer) are ***"amazing"—"bewildering"—"phenomenal."*** Such exclamations are no mere "word gestures." The same expressions come to me in letters from all over the States from those who have bought my Delphiniums. The original English strains imported by me have been acclimated and improved by expert cultivation and hybridizing. Their size, vigor and uncommon colors are inbred by me in a thoroughbred stock, kept pure by careful *"rogueing."* The highest awards that Horticultural judges can give, have been heaped upon them at leading shows, including gold medals at New York, America's greatest flower show. No Hardy Flower Border is complete without ***"Duckham's Delphiniums."***

Prices For 1930

Large Field Divisions, **embracing the complete color range from delicate lavender and mauve to deep indigo blue—***Doz. $11.00; 100—$85.00.*

Selected Types and Colors, **the world's choicest,** *Each $2.50, $5.00, $7.50 and up—All field-grown.*

Read the whole story of these amazing Flowers in my latest catalogue, Booklet N, mailed free upon request

WILLIAM C. DUCKHAM

Rose & Hardy Plant Specialist

BOX N, MADISON, NEW JERSEY

OUR OWLS IN FABLE AND FACT

(Continued from page 148)

red and gray color-phases. Its habits resemble in general those of its larger cousin, and its food consists largely of small mammals and many insects. Doubtless small birds are sometimes taken, but on one occasion pairs of house finches and chestnut-backed bluebirds were raising families in a dead pine stub in which was also nesting an owl of this species. The note is described as a mellow "whoot" repeated at regular intervals.

The hawk owl, *Surnia ulula caparoch,* is so called from its fancied sharing of hawk characters, but it is, of course, a true owl. It barely enters the United States, except as a migrant in winter, as it is a bird of the north, and with its old world representatives ranges around the northern hemisphere. There it is necessarily a day hunter, and the relatively small head and eyes, which seem to be correlated with this habit, mark it from the typical night-hunting owls. The food includes many of the small mammals of its habitat, especially mice and lemmings, and also ptarmigan and other birds. It nests in the hollows of trees, and also in open nests, usually those discarded by other large birds.

Our burrowing owl, *Speotyto cunicularia hypogaea,* is in many respects the most remarkable of our owls. By using for its home the deserted burrow of prairie dogs and other rodents of the treeless plains, this queer little owl is able to live in regions which would seem inhospitable to birds of this class. Since the burrowing owl in some form extends from the southern extremity of South America to southern Canada, including even some of the islands of the West Indies, and Florida, the list of animals whose burrows are utilized naturally includes a great many species. The nest is placed deep in the burrows and usually holds from six to ten eggs. The reputed friendly sharing of the burrow by the prairie dog, burrowing owl, and rattlesnake is of course a fable. As a matter of fact, the young prairie dogs help to support the owls, and these must sometimes lose their eggs to the rodents; certain it is that the rattlesnake preys to some extent on both of its neighbors.

But the burrowing owl by no means depends on its neighbors for food. Mice, ground squirrels, small reptiles, and some birds are among its stand-bys, and the larger insects, including many that are destructive to man's interests, are eaten in large quantities. Altogether, this little owl must be reckoned as one of our most useful species, and well deserving of the protection it usually receives. Formerly, however, it figured in the list of those killed extensively for millinery purposes, and even now, it is among those killed for bounty in those sections that still resort to this destructive and ill-advised method of destruction.

A forest-loving species is the pygmy owl, *Glaucidium gnoma,* whose eerie qualities are reflected in his specific name. It is a bird of our western country from the Mexican boundary northward to southern Alaska. Its general color is wood-brown above, with lighter spots, and the underparts are light, streaked with brown. It is our smallest owl

of wide distribution, but its prowess can not be measured by its size, for it has been known to overcome ground squirrels of twice its bulk. Mice, lizards, and insects of many species form its usual food, and it also preys on birds of various kinds, some of nearly its own size. Its standing with the small forest birds is indicated by the jeering, excited companies that gather when an owl is discovered in its daytime retreat in some shady evergreen.

The ordinary call is a succession of soft notes, somewhat like those of the saw-whet, but lacking the metallic twang and uttered at shorter intervals. Other notes are described, one of which resembles that of the mourning dove. Sometimes the calls seem to be in the nature of a song, and may be given from a high perch during the daylight hours, especially on cloudy days; some of its hunting also is done in the daytime. The nest is usually in the deserted hole of a woodpecker, and the three or four white eggs are a little over an inch in length, about the size of robins' eggs.

A truly fairy species is the elf owl, *Micropallas whitneyi,* the scientific name of which is given in allusion to the goddess of wisdom, to whom the owl was dedicated, and the common name in reference to its fairy-like form and elusive habits. It is the smallest of our owls, and one of the most restricted in range. So far as known, its range is nearly co-extensive with the giant cactus. The food of this little owl consists almost entirely of ants, beetles, crickets, caterpillars, and the small mammals of the desert.

In the deserted nesting holes of the Gila woodpecker, the gilded flicker, and perhaps some other species, excavated usually in the trunks of the giant cactus, the eggs are laid. The owl is thus practically dependent on the good offices of these carpenters, and on the presence of this picturesque tree. Several other birds also nest in the holes provided by the woodpeckers, and the scattered patches of giant cactus thus furnish homes for an interesting congregation of species that would find it difficult to persist if the cactuses were destroyed. This should be an added incentive to perpetuate as many as possible of these unique trees, which in themselves are nearly as worthy of preservation as the redwoods, or other more impressive species.

National Forest Survey

A comprehensive appraisal of existing forest supplies and conditions, growth and requirements, and of present and future trends, all of which, when properly coordinated, will constitute a fundamental and economically sound basis for determining Federal, State and industrial forest policies and programs, was authorized under the McSweeney-McNary Act of 1928. This survey is now getting under way with the appointment of C. M. Granger from the position of District Forester of the Pacific Northwest District to be forest economist in charge of the national program. Congress has authorized a Federal contribution of $3,000,000 for the project, with a small initial appropriation of $40,000 available this year. The time has certainly come when we should really take stock of our forest resources that we may plan for the future.

A PICTURE ONE DOES NOT FORGET

LACKING its entrance planting of Evergreens, this home would call for no special comment. But with a setting of Red Cedar, Arborvitae and dwarf Juniper it becomes a thing of outstanding beauty.

Everywhere Hill's Evergreens provide that added distinction and charm that one does not forget. It's a beauty that grows. Year after year its charm—and value—increases.

Here at Hill's we have specialized in Evergreen growing for three-quarters of a century. In our 600-acre nursery is every kind, in all sizes—the result of a world-wide search for new, beautiful varieties.

Send for this season's catalog. What to plant and how is interestingly set forth—with 50 illustrations in colors. Enclose 25c (coins or stamps), which will be refunded on any order you may send us.

D. HILL NURSERY CO.

EVERGREEN SPECIALISTS

LARGEST GROWERS IN AMERICA BOX 297 • DUNDEE, ILL.

HILL'S EVERGREENS

EVERGREENS

Evergreens, Rhododendron Max., Kalmia, and Hemlock. Seedlings 6 to 18 in., 100, $6; 2 to 4 ft. 25, $5; 100, $18; Carload for, $150.00;

J. F. NORRIS Doeville, Tenn.

NUT CROPS

The North's future soil production

Progressive farmers are planting groves of improved grafted nut trees. Learn why. Send for free price list or enclose 10c for literature.

John W. Hershey, Nut Trees, Box 65 (1), Downingtown, Pa.

Water Lilies in Tubs or Pools

You can have them just as easily as common flowers. This special *Collection No. 4* costs little, but returns much.

1 **Waterlily** (White, pink, yellow, your choice)
6 **Water Plants** (Our selection)
6 **Hardy Perennials** for background

All these for only $3

If you want a tub add $2

Our Catalogue tells all about Water Lilies, Water plants, Fancy Fish for tubs and pool. Many pictures in color. Send for a copy.

THREE SPRINGS FISHERIES

10 Pythian Building Frederick, Maryland

Burpee's Seeds Grow

The Vegetables and Flowers you would like to see growing in your garden—read all about them in Burpee's **Annual Garden Book.** This is the catalog that tells the plain truth about the *Best Seeds That Grow.* It describes the Burpee Quality Seeds, Bulbs, and Plants.

Write for a free copy of **Burpee's Annual.**

CUT HERE

W. ATLEE BURPEE CO.

287 Burpee Building, Philadelphia

Send me a free copy of Burpee's Annual.

Name.....

R. D. or St.....

P. O.....State.....

Viburnum Carlesi

(Mayflower Viburnum)

A most delightful shrub of recent introduction. The bush is rather slow-growing and of medium height when mature. It blossoms in May and the flowers are as beautiful and as intensely fragrant as the Trailing Arbutus or Mayflower. Plants of this wonderful shrub are very scarce but we have a good supply at these prices:

18-24″ plants

$2.25 each **$20.00 per 10**

2-2½′ plants

$3.00 each **$28.00 per 10**

Less 10% if ordered and paid for before March first.

If you need Evergreens, Shrubs, Vines, Fruit Trees, Berry Plants or Perennials, do not fail to send for our new 1930 catalog.

GEORGE D. AIKEN

Box Z, Putney, Vermont

"Grown In Vermont, It's Hardy"

Rare Plant **DARLINGTONIA**

A perennial. Grown as a house plant, or outdoors. One of the most peculiar plants known. Requires very little care. Depends on living creatures such as flies, mosquitos, ants, etc., for food. Its pulpit-like stems twine and fold to form a mouth that is lined with tendrils which exude a honey-like liquid, particularly attractive to insects. Once inside that mouth there is one less insect, so "Darlingtonia" is a plant that every well-regulated family should have. Blooms in the Spring —a beautiful purple flower.

Order Today

We will mail postpaid one good healthy root for 65c. **Satisfaction Guaranteed.** Our big **Free Catalog** shows hundreds of bargains in trees, shrubs, plants, vines, roses, hedges. etc. **We Pay Transportation.**

SPRING HILL NURSERIES

Dept. 111 **Tippecanoe City, Ohio**

BAGGING THE BAGWORM

(*Continued from page* 166)

two weeks time netted twenty-eight pounds of bags—tubs full. These were kept in one corner of the class room for observation as a further part of the project. Parasites emerged. Eggs hatched and the habits of the baby bagworms were observed. Thus was the beginning of the history of the bagworm introduced to the pupils.

The superintendent of the city schools was much interested in the report given of this new project and asked that it be extended into all the grade and junior high schools in the system. Campaigns were organized in the schools. Teachers and pupils were introduced to the pest by the original investigators and acquainted with the facts collected by them. Soon research was going on in every building. Interesting data concerning the species of trees most attacked, parasitic control, and facts about the life history of the bagworm were obtained.

The boys and girls of the city collected 391 pounds of bags during this campaign, averaging about two thousand per pound. These bags were burned with ceremonies by the individual schools after some of the parasites had emerged. Some of the citizens followed the advice to spray the trees in which the bags could not be reached by the hand-picked method and killed many larvae as they hatched early in June.

Children began to prepare for the second campaign as soon as the leaves fell, though the dates were set for next March. The bags were gathered from all the schools and burned at a public bonfire at which representatives from each school were gathered.

An additional incentive was given to the third campaign, in 1928, when a group of the business men of the city, recognizing the worth of such a campaign to the welfare of the city, offered a silver cup to the school bringing in the most bagworms in each of the seven districts. A larger cup was also offered as a city prize. The enthusiasm that at once was put into action! Seven hundred and four pounds of bags were collected in Kansas City and vicinity. Boys had invaded the territory among the willows along the rivers from whence the bagworm migrated into the residential section of the city. The children had become "bagworm conscious." The winning school collected ninety-one pounds of bags.

Marked signs of the success of the former campaigns greeted the city in many sections when plans were made for the fourth attack in March, 1929. The campaign occupied about half the time allotted to the former ones. Again the business men offered prizes. All the schools were again represented in the program, gathering by the close of the campaign, a total of three hundred and twenty-five pounds. Nature had failed to deliver the warm weather necessary to liberate the parasites. Kansas City needed them to help fight the enemy so the bags were placed aside for several weeks to permit the parasites to emerge before the bags were burned.

The campaign against the bagworm in Kansas City has been successful in many respects. Beside giving the children first-

New Discovery Guarantees Better House Plants & Garden

This new, easy, economical method of fertilizing being praised by everyone who tries it. A highly concentrated plant food in tablet form.

FULTON'S

PLANTABBS

ODORLESS PLANT FOOD TABLETS

One tablet a week in pots makes plants grow magically. Will make your Roses the finest ever. Perennials thrive as never before. Annuals "bloom their heads off". Nothing better for Dahlias and Gladiolus. Use PLANTABBS along rows of flowers and vegetables. Four to a gallon of water make rich liquid fertilizer—wonderful on lawns. Small box 25 cts; medium 50 cts; large $1.00; professional size $3.50. This is the only fertilizer GUARANTEED to improve plants.

FREE Booklet by F. F. Rockwell, noted writer of garden books. Full of valuable information, free with every box of genuine Plantabbs.

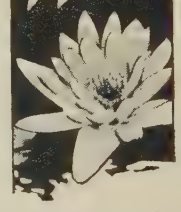
Ask for Fulton's Plantabbs—accept no substitute. Sold widely by seedsmen, florists, hardware and drug stores. Sent prepaid if your dealer cannot supply.

Note difference in plants shown. **PLANTABBS** *made this improvement possible*

PLANTABBS CORPORATION
2775 Court Sq. Bldg
Baltimore, Md.

ADD BEAUTY TO YOUR GARDEN

***with a* Water Lily ~Pool~**



Full information on building and caring for a water garden is found in our new 36-page catalogue. Many illustrations, some in full color, are included in the description of over 100 varieties of beautiful and rare lilies. Inexpensive postpaid collections are shown. You should not be without this practical and beautiful handbook of water lily lore. It is *free*—send for catalogue *today*.

JOHNSON Water Gardens

N330 ✦ Hynes, California

GLADIOLUS BULBS

Our offer to you. We list in our catalogue about 500 varieties and in order to add the newer originations each year, it is necessary that we eliminate some of the older ones. Last Spring we discontinued 90 varieties by planting them in a Mixture. The result at blooming time was wonderful. Every hue and color known in Gladioli was there.

Would you like to see them in your own grounds? If so drop us a Postal and we will mail you 100 bulbs, one inch and up in diameter, of this Mixture. On arrival you pay the Postman $1.00 and postage. 1000 for $10.00 and postage. Our price list free. It gives the names of varieties in Mixture. This offer good until June 15th subject to prior sale. **LEGRON FLORAL CO.**, 130 Amherst Drive, Toledo, Ohio.

A.E. WOHLERT

The GARDEN NURSERIES Narberth Pa.

Oriental Flowering Trees

America's Finest Collection

Japanese Rose Flowering and Weeping Cherries, Flowering Crabs; in all varieties and sizes. Send for free book with color illustrations.

A. E. WOHLERT
927 Montgomery Avenue
Narberth, Montgomery Co., Pa.

TEN CACTI

Blooming size **All differen**

Postpaid for $2.50

Table garden size $2.00

JAMES ALLAN

Mountain Park **New Mexic**

Stupendous
OFFER OF
High Quality
BULBS
All Blooming Size

GLADIOLI OF DISTINCTION
1000, $18.00; 100, $1.90; 50, $1.00

Not the ordinary field mixture, but a superfine collection, consisting of such varieties as: Anna Eribius, Baron J. Hulot, Crimson Glow, E. J. Shaylor, etc.

EXHIBITION DAHLIAS
Doz., $1.50; each, 15c.

A selection of splendid varieties: Jersey's Beauty, King Harold, Yellow King, etc. Products of our own nurseries.

FREE WITH EACH ORDER of 12 Dahlias and 100 Glads.: 1 beautiful blooming size Azalea, 1 baby Blue Spruce and 1 baby Norway Spruce. If you prefer send one-quarter of the amount of your order now and the balance to be collected on delivery of the bulbs.

Order Now and Get a Good Selection!!

Add 15c for packing and postage.

THOUSANDS CONVINCED—REPEAT ORDERS PROVE IT.

15,000 New Customers in 1929, but what pleased us more was the large number of customers of the previous year who came back to us for their 1929 supply of bulbs.

HOLLAND BULB CO.
Dept. N Lake Como, N. J.
NURSERIES: Noordwykerhout, Holland, and Lake Como, N. J.

WILD FLOWERING PLANTS

18 beautiful flowering plants for pool $5. White Mulberry, Gene Stratton Porter's favorite for attracting birds, 5 to 6 ft. $1.50; 3 for $3; 10 for $6. Catalog showing 85 varieties free.

Terrell's Aquatic Farms
24N Blk., Oshkosh, Wisconsin

hand information, the campaigns have done much toward educating the public at large and awakening it to its duty in civic projects such as tree conservation. There are also tangible results. More than seven hundred millions of bagworms were exterminated in the bags that were collected. The foliage of the trees is in better condition in late summer and less reserve strength is expended in growing a second set of leaves at that season than in former years.

It seems probable that in the not distant future boys and girls in the United States will wage a victorious war against injurious insect pests in behalf of their heritage of beautiful shade trees and pass them on to future generations with increased resistance to weather storms for years to come. Unless the children come in personal contact with the habits of the insect enemies in their communities and perform their bit of research, the lasting value of the campaign is lost. The duty of the school is to educate the future citizens concerning those facts assisted by organizations such as the Boy and Girl Scouts. The aggressive citizens of the communities and the civic clubs can boost the campaigns and foster this education for tree conservation.

Bag the bagworm and save the trees in which is written the history of the elements and of civilization. Help the parasites win the battle against the insect pests.

Make
YOUR GARDEN PLAN
from the pages of
NATURE MAGAZINE

"Gold Medal" DAHLIAS

Prize Winners at leading American Shows

FOR five years in succession our Dahlias have won First Prize "Gold Medal" at New York Show—greatest in the country. Some of these winners of former years are still leaders the country over, but can be bought for a fraction of their original cost. We offer five of them below at the most amazing price Great Dahlias have ever been sold.

SPECIAL COLLECTION (N)

	Present List Price
Trentonian, amber and bronze	.75
Sanhican's Peach, peach cheek color	3.00
Sanhican's Gold, pale orange yellow	1.50
Roman Eagle, burnished copper	1.50
Margaret Woodrow Wilson, opalescent pink	1.50
Total List Value	8.25

SIZE FORM STEM (What the judges look for)

Here is an $8.25 present-day value (varieties that only a few years ago cost $5.00 to $10.00 each). Five great Prize-Winning Dahlias for **$6.00**

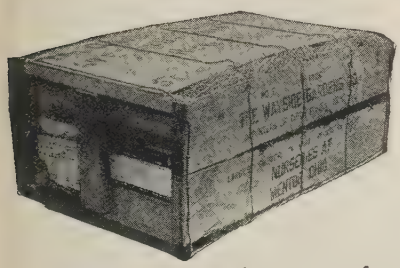
For the connoisseur who seeks the latest creations, we have several 1929 and 1930 introductions that have topped the list of Winners at the recent Autumn Shows. They are

"DOROTHY STONE" "KATHLEEN NORRIS"
"HELEN IVINS" "EDNA FERBER"
"GROVER WHALEN"

Complete descriptions and prices of above will be found in our New Catalogue, the leading book of its kind in America. Mailed free upon request,—ask for Booklet N. 1939.

Fisher AND Masson
"Gold Medal" "Dahlia Growers"
SANHICAN GARDENS
TRENTON NEW JERSEY

The Best Planting Time For Rockery Plants



When writing for the catalogue, enclose 25 cents for which we will send our own fully illustrated booklet telling in a practical and neighborly way how to build a rockery and what to make it with. This booklet is charged for at cost, 25 cents, which sum may be deducted from your remittance when sending us your order.

ROCK PLANTS are early bloomers. If you don't plant early you lose those blooms. A whole year before they will bloom again.

That's one reason. Here's another. Nature has a zip and go to her early doings that helps the roots to get a quick grip on the soil and start right in getting busy on the top growth. The days are warm and the nights cool, which is Nature's way of keeping a balance between root growth and top growth. So let's be fair to Nature and do all our planting before it gets too hot.

It may sound like tooting our own horn considerably, but the fact remains that no one has such a wide variety of Rock Plants and Hardy Plants. Or sells such finely finished big husky clumps. They are packed with extreme care. That's one reason why we can guarantee arrival in good condition. If they don't we cheerfully replace any not top notch. And when we say cheerfully, we mean just that.

As a parting thought, all our plants are field grown clumps. Not cheap little seedlings or little pot plants but good strong field grown roots. We send them to you just when at their best for transplanting. Write for catalogue. It is free.

Wayside Gardens
MENTOR, OHIO
U.S. Pat. Off. E. H. Schultz, *Pres.* J. J. Grullemans, *Sec'y-Treas.*

Dependable, Delightfully Odd, New Flowers

from **Bassi**

WALLFLOWER, Hardy Perennial, (Cheiranthus Linifolius). — A curious, dwarf specialty, purplish lilac, pastel shade, upright habit with stalks covered with bloom. Good for rock gardens. **Pkt. 25c; 5 pkts. $1.00**

MARIGOLD, "Radio", Annual, (Calendula).—Petals beautifully quilled, have an extra ordinary effect on the flower's appearance, perfecting such beauty of form that it should be in everyone's garden. **Pkt. 25c; 5 pkts. $1.00**

LARKSPUR (Delphinium).—Blackmore & Langdon's Giants. A mixture saved from the finest prize-winners shown at different exhibitions in England. Spikes 5 to 6 feet high. The only one to receive R. H. S. medal in England in 1924 and 1925, and two in 1927. **Pkt. 50c; ¼ oz. $2.50**

AFRICAN DAISY, Annual (Dimorphotheca Ringens).—A new form of the Veldt Daisy. Flowers large, inside pure white with a conspicuous blue ring around the center or "eye." Adds greatly to its beauty. **Pkt. 35c; ¼ oz. $1.25**

CALIFORNIA POPPY, New Frilled, Annual (Eschscholtzia Ramona).—A distinct, very charming type, the frills giving it the appearance of a double flower. A pale, glittering coppery gold with pink shadings, very pleasing. Unusually attractive novelty. **Pkt. 25c; ¼ oz. 75c**

HELIOPSIS, Double, Perennial, Lemoine Strain.—This remarkable strain is a great improvement over the ordinary single and semi-double. Flowers are very large, brilliant golden yellow, twice as large as the ordinary variety on long, stout stems. **Pkt. 35c; 5 pkts. $1.50**

SPECIAL SEED COLLECTION
One packet each of these 10 outstanding varieties of seed priced at $2.95 for **$2.00**

LARKSPUR, "Los Angeles" Annual, (Delphinium).—Beautiful, new, double stock flowered Larkspur of vigorous habit, exceptionally tall. Blooms are a rich salmon ground, overlaid with a brilliant rose. Foliage is dark green, making the flowers stand out prominently. **Pkt. 25c; 5 pkts. $1.00**

TOAD FLAX, Perennial, (Linaria Macedonica Speciosa) Reselected—Flowers resemble large, golden yellow snapdragons, stems averaging three feet. Attractive silvery foliage. Easily grown from seed. Perfectly hardy; useful for rockery. **Pkt. 25c; 5 pkts. $1.00**

VERBENA, MAMMOTH GOLDEN QUEEN, Annual.—As in Asters, a clear golden yellow is very difficult to produce in Verbena. Medium sized flowers borne on a vigorous vine, ever-hearing and early. Valuable for bedding. **Pkt. 25c; ¼oz. 75c**

ZINNIA, "Youth" Annual, Gold Medal, Dahlia Flowered.—Valuable new addition of the Dahlia Flowered type, a beautiful soft rose self. Flowers well formed, grown on robust plants. Very vigorous and free flowering. **Pkt. 25c; ½ oz. $1.50**

RANUNCULUS, "Double Giant French".—Large, double buttercup-like flower on long stem. Beautiful shades of bronze, etc. Desirable as garden plant and cut flower. **$1.25 per dozen, 8 for $1.00**

Special Offer On Montbretias
(Special Mixture) Beautiful gladiolus-like flower on long slender stem. Blooms from July to frost. A very satisfactory cut flower.
25 for $1.50; 100 for $5.00 Postpaid

Write today for our 1930 book "Everything for Spring Planting." It's free!

COMBINATION OFFER:
$4.75 value for $4.50

10 Packets of Seeds here described	$2.00
25 Montbretias, special mixed	1.50
1 Dozen Ranunculus, special mixed	1.25
	$4.75

$4.75 Value, all Postpaid for $4.50

Bassi Frères Inc. de Paris

SEEDSMEN AND NURSERYMEN
506 Main Street New Rochelle, N. Y.

STRAWBERRY PLANTS

Send for Allen's 1930 Book of Berries, a mine of reliable information about *Strawberry Culture*, varieties, PLANTS. Write today for your copy—*free.*

The W. F. ALLEN CO.
270 Market St. Salisbury, Md.

NATURE NEWS AND VIEWS

Mrs. Edison on Nature

"Outdoor life and the great healing power of Nature seem to contribute most indispensably to contentment," writes Mrs. Thomas A. Edison in *Playground and Recreation*. Mrs. Edison is a life member of the American Nature Association. "People who lack close contact with them cannot be really happy; these things are too fundamental.

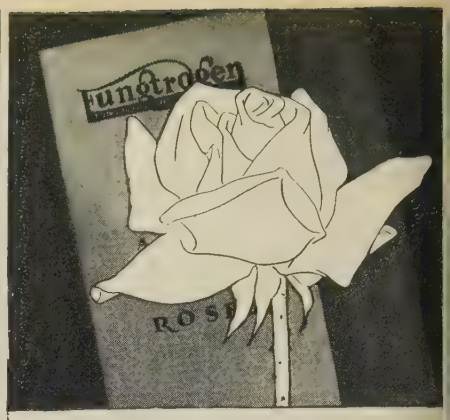
"We are facing a vast challenge, but I believe it can be and will be met. I like to look ahead to the time when every American city and town and country district will have opportunities for more and better play, will enjoy leisure time pursuits that build up the body and minister to the mind and spirit. One of the most important things this group can do is to show our young people that the best things of life are free; that they may be had without paying a cent. Bring our children closer to the simple and fundamental; help them to discover hobbies that they may keep all their lives; train their hands and hearts to the joy of creating perfect things; hold up to them ideals of fine sportsmanship, and we will have a better nation tomorrow."

Roadside Beautification

The nation-wide movement toward roadside beautification is gathering rapid momentum. In a recent statement, Thomas H. MacDonald points out that the planting of suitable trees and shrubbery along all highways of the Federal-aid system should be regarded as eventually necessary. Massachusetts maintains a state nursery for growing trees to be planted along new highways and has legislation preventing the cutting of shrubs and plants. Connecticut will spend some half a million dollars in the next few years on landscaping projects, and maintains a landscape division; Missouri employs a landscape architect and offers his services to civic organizations wishing to beautify their towns. In California, more than 680 miles of roads have been beautified by tree plantings. Other states lending a hand are Delaware, Georgia, Illinois, Kentucky, and Wisconsin. Difficulties appear in the Southwest, due to dryness of climate, and in the snowy regions of the Northwest, where trees cause snow to drift across the roads, but elsewhere the plans for pleasing the tourist trade and making the state beautiful to the visitor are being carried out apace.

Benton Lake Refuge

By Executive order, President Hoover recently set aside 12,234 acres at Benton Lake, Montana, near the city of Great Falls, as a bird refuge and wild life sanctuary. More than three thousand acres of the tract consist of water area, with abundant aquatic plant growth for cover and food. All hunting will be prohibited in the refuge.



Grow Better Roses

ROSES respond amazingly to the cleansing, stimulating effects of Fungtrogen Spray. Mildew and Black Spot disappear. Foliage becomes bright and luxuriant. Blooms of rare, new perfection appear.

Fungtrogen is quite unlike any other spray known. It is invisible. Easy and pleasant to use. Simply mix with water and spray. Half pint makes 15 quarts of spray. Leading horticulturists enthusiastically endorse it.

Prepaid: half pint $1; pint $1.50. At your dealer's or send check.

Complete Rose Treatment includes Companion Sprays: APHISTROGEN, kills aphis (plant lice); INSECTROGEN, kills leaf-eating insects.

Write for free bulletin, "Black Spot Control."

ROSE MANUFACTURING COMPANY
3646 Filbert Street Philadelphia, Pa.

Fungtrogen
FUNGICIDE AND STIMULANT
REG. U.S. PAT. OFF.

SHUMWAY'S

Good Seeds

produce Flowers and Vegetables of Superior Quality

New crop, tested seeds, grown from the finest selected stocks—sure, vigorous producers.

For 60 years satisfied customers have bought Shumway's Good Seeds at reasonable prices and received the desired results.

FREE—Large catalog with hundreds of pictures of vegetables and flowers. Send your own and neighbors' addresses *today.*

R. H. SHUMWAY
121 S. First St., Rockford, Ill.

GLADIOLI McKibbin

Wonderful varieties, plain and ruffled, strongest stocks, prize-winning strains, grown, cared for and selected by a gladiolus lover. Not the most varieties, just the best. Every bulb perfect. Sure to flower gloriously.

Write today for my list containing great introductory offer.

JOHN H. McKIBBIN
1399 Division St. Goshen, Ind.

The Genius

The fate of a genius seems to be sad in whatever order of the animal kingdom he exists. His part seems to be that of Sybil, whose truthful utterances no one would believe; and even his actions are decried and laughed at. Man knows well what happens to the Nietzsches and Schopenhauers on Earth, but it remained for Ida M. Mason of New York to picture the reaction of the hornet mob to the architectural aspirations of another hornet who refused to follow the patterns laid down through endless generations.

"Outside our dining room window in the country," she writes, "we saw the building of one of those huge gray paper hornet's nests. It was fastened to the top of the stone window frame, so that it was easy to watch its progress each day. It was most fascinating to see the little workers pasting on row after row of well-chewed old wood material. These rows were about the width of a pin head, and each outer layer of the nest was about one quarter inch from the preceding inner one. As we watched day by day it seemed that each worker had his own section, and all was order and harmony. When the nest was about the size of a grapefruit, a leaf from the overhanging ivy touched a portion of the upper part, and to our amazement the worker that had charge of that particular section cemented that green leaf into the structure like a green glass window. It was done perfectly and all superfluous leaf was cut away, a marvel of workmanship and ingenuity. We could look from beneath, as this layer was not quite half finished, and see the green light through the window. Next morning at breakfast we noticed a lot of tiny green specks on the window sill. On going out to investigate we found our ingenious worker busily biting out his masterpiece that he no doubt had made with such pride the previous day. Evidently the inspector had 'bawled him out' for thus diverging from the hornet blueprint laid down centuries ago. There was the unappreciated genius working for dear life, undoing all his lovely work. After the green window was all out he patiently wove back and forth the old gray stuff such as his ancestors had used, and the stained glass window was a pile of tiny bits on the sill. The work was all finished by evening and not one hornet helped him though there were others pasting on the conventional stuff out of his territory. We are curious to know whether we are the only ones who have seen a hornet genius. Perhaps when his work was finished he was sealed up in a cell to die a martyr's death for daring to deviate from age-long plans of hornet architecture."

Kelleter Appointed

Wisconsin has selected Paul D. Kelleter, formerly of the Federal Farm Board, to serve as its director on the State Conservation Commission. The new chief was for twenty years a member of the United States Forest Service and brings to his new office a wide conservation experience. The Commission recently set aside a new wild life refuge in Oconto County to be known as the Archibald Wild Life Refuge. It was established on land of the Holt Lumber Company and comprises 3420 acres.

A Fall-Blooming Tree Of Unmatched Charm

White as winter's snows, a center of golden stamens, and a delicate fragrance, the blooms of Franklinia (Gordonia) are matchless in loveliness.

The flowers, about 3 inches across, open in mid-August and are produced continuously until frost. The tree is hardy, in protected situations, as far north as Boston, growing readily where rhododendrons thrive.

Extra heavy plants, 27 to 33 inches high, $7.50 each Splendid specimens, 18 to 24 in. high, $5 each, 10 plants for $45.

Orders should be placed at once for spring shipping. Further description and details on request.

WHITESBOG BLUEBERRY NURSERIES
Joseph J. White, Inc., Whitesbog, New Jersey

Scott's Creeping Bent for Perfect Lawns!

Sod in six weeks! A rich, velvety stretch of lawn that chokes out weeds before they can grow! A deep, thick, uniform turf that makes your home a beauty spot! That's what you'll get if you plant Scott's Creeping Bent.

The New Super-Lawn

Creeping Bent—long recognized as the ideal grass for golf putting greens—is now producing Super Lawns. Instead of sowing seed, you plant stolons or the chopped grass—and in a few weeks you have a luxuriant lawn like the deep green pile of a Turkish carpet!

O. M. SCOTT & SONS CO.
261 Main Street MARYSVILLE, OHIO

This little book "Bent Lawns" is free to you. It is a valuable treatise on how you can have beautiful lawns. Write today for your copy.

This Complete Waterlily Pool

All the joys of a big pool are in this low-priced tub garden collection.

1 **Waterlily** (blue, pink, white, or yellow, your choice of color)
1 **Arlington Waterlily Tub**
1 **Pair Japanese Snails**
6 **Water Plants**, for the tub
6 **Perennials** for border or rockery

This Complete Collection $5
Collection Without Tub $3.50

Our New Catalogue Free

describes and pictures the finest Waterlilies, Waterplants, Fish and Aquariums. Tells how to build the pool and plant the water garden. Send for a copy today.

ARLINGTON WATERLILY GARDENS
682 Forest St., Arlington, N. J.

Vaughan's gardening illustrated

165 flowers in full color

A seed catalog unlike others, a beautifully illustrated magazine of home gardening information, the culmination of 54 years of thoughtful service to the American home gardener. It is The Most

BEAUTIFUL SEED CATALOG

containing the most complete collection of correct illustrations of annual flowers in true colors ever published in an American Seed Catalog. Inspirational and instructive

ARTICLES BY EXPERTS

on the latest fashions and discoveries in gardening. Special 1930 Offer: The new Chinese Forget-Me-Not packet—10c. Catalog sent with seed or alone, free.

VAUGHAN'S SEED STORE Dpt. 17
10 W. Randolph St., Chicago
47 Barclay Street New York City

Order *Gladioli from* KUNDERD

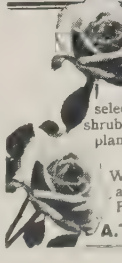
***Golden Anniversary Gladiolus Book*—FREE**

To be sure of getting genuine Kunderd Gladioli send your order to Kunderd himself. This is Kunderd's fiftieth anniversary. His Golden Anniversary Gladiolus Book is full of surprises. Hundreds of gladioli listed. 130 brand-new this year. 63 pictured in color. Full growing directions. Interesting gladioli information. Special anniversary collections. Use coupon.

A. E. Kunderd
211 Lincoln Way West, Goshen, Ind., U. S. A.
Dear Sir: Please send me your Free Golden Anniversary Gladiolus Book.

*Name*_____
*Street or R. F. D.*_____
*City*_____ *State*_____

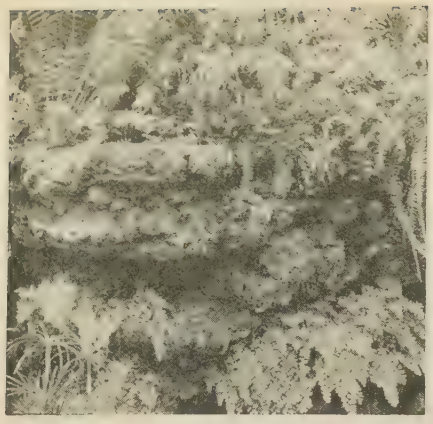
DELAMARE GARDEN BOOKS "NONE BETTER"



FREE to those interested—Catalog No. 16, describing selected books on flowers, fruits, vegetables, trees, shrubs, landscape gardening, soils, insect pests and plant diseases, growing plants under glass, etc.

TWO OF OUR SPECIALS:
Water Gardens and Goldfish, by Sawyer and Perkins, $1.65; Birds of the Wild, by Frank C. Pellett, $1.90, both postpaid.

A. T. DeLaMare Co. Inc. 448-1 West 37th St. New York, N. Y.



Unusual Ferns *for the* Rockery

FOR the first time in several years, the South has contributed some rather rare ferns to our extensive collection. Connoisseurs having rockeries will welcome these especially, for they are the pigmy folk of the fern world, growing from two to twelve inches high, depending on the variety.
Here they are:—

Camptosorus rhizophyllus (Walking Leaf Fern) 2-6 in.
Pellaea Atropurpurea (Purple Cliff Brake) 4-10 in.
Cystopteris bulbifera (Bladder Fern) 8-12 in.
Asplenium ebeneum (Ebony Spleenwort) 4-8 in.
Asplenium trichomanes (Maidenhair Spleenwort) 2-4 in.
Polypodium vulgare (Rock Fern) 4-8 in.

Special Offer: We will supply two each of the above, postage paid, for $3.00; five each of the above for $5.00; ten each of the above $9.00.

Spring's Most Brilliant Floral Surprise

The Flame Azalea is, perhaps, the most gorgeous of all Spring flowering shrubs. During May and June the plants are completely smothered by orange, yellow or flame-colored blossoms of brightest hues and diverse shades.

The plants we offer are extra choice, symmetrical specimens, with a marvelous root system. Shipped with large ball of earth, properly burlapped and packed to arrive in perfect shape anywhere in the United States at the following prices:—

***Azalea calendulacea* (Flame Azalea)**

	Each	*10*
1 to 1½ feet . .	$2.50	$20.00
1½ to 2 feet . .	3.00	25.00
2 to 2½ feet . .	3.60	33.00

OUR FREE CATALOG

will prove delightful company for those interested in naturalistic forms of gardening. Gladly mailed on request to those mentioning this publication.

GILLETT'S
Fern and Flower Farm
7 Main St., Southwick, Mass.

AT IT HALF A CENTURY

Our Florida Map

Under the caption "Maps That Get You Somewhere", the Cincinnati *Times-Star* does an editorial on the map done by Mr. Jex for the cover of our Florida issue in December. We republished the editorial herewith, both because we like to have such nice things said about us and because it also reflects our own views. Here it is:

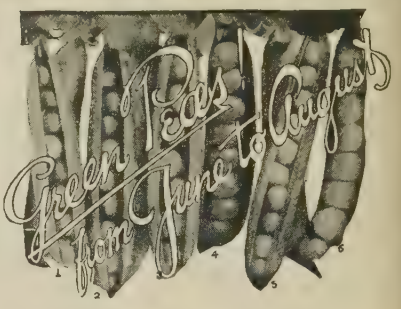
"The cover drawing of the current Nature Magazine is a colored map of Florida, but it is not at all like other maps of the time. It is pictorial in an engaging and yet informative way. Set down here and there on a golden background are little sketches of animals, persons, and things, each of which is labeled. Among other items one notes a cormorant, an egret, a wild turkey, a pelican, a wintering duck, a burrowing owl, a cougar, a possum, a deer, a cow, a 'gator, a Seminole wigwam, a beehive, a clump of cypress, an orange tree, a bunch of sugar cane, a box of strawberries, a handful of tomatoes, a cluster of peppers, a watermelon, a cotton plant. The neighboring Gulf waters show a manatee coming up for air, a barracuda pursuing a bather, a peaceful red snapper, a sedentary sponge. Further phenomena pictured ashore are the silhouette of a batter and the legend 'baseball training camp,; a glittering dime and under it the initials 'J. D. R.'; the Suwanee River with an African plucking a banjo; and a campfire on the Caloosahatchie with the forms of 'Henry, Harvey and Tom' grouped about it.

"While the magazine cover is intended to be humorous, it is about the best map we have seen that bears a later date than the Middle Ages. The old cartographers did things like this, to the entertainment and instruction of all. They were superseded by misguided moderns afflicted with the fallacy that cities are more interesting than people and things, and that mountains and rivers are not worth noting. The usual map of the time is a dreary thing cluttered up with the names of insignificant towns all very much alike; towns you wish to ride through in a sleeping car in the small hours of the night. It takes a magnifying glass to find what you want upon it. In behalf of the Renascence of Wonder let us have more maps on the good medieval pattern."

Man's Origin

The birth of modern man was pushed back to at least 1,250,000 years by the recent pronouncement of Henry Fairfield Osborn, retiring president of the American Museum of Natural History, to the effect that the Piltdown man, *Eoanthropus dawsoni,* was the oldest known human ancestor. The Piltdown man has been constructed by scientists from a skull and jaw found at Piltdown, Sussex, England, by Charles Dawson in 1911, and has been considered to represent a much later state in man's development than *Pithecanthropus erectus,* the ape man of Java, long believed to be the earliest record of man. If Dr. Osborn is correct, man some 1,250,000 years ago had a brain capacity equal to the minimum of that of living Veddahs, Papuans and native Australians, the most primitive men, and indicates that the long ice ages brought no great changes in the human brain, but merely gave the finishing touches to his development. This will bring out much argument on this point.

Do You Know



The Secret?

Late planted peas seldom mature properly—too much warm weather! Plant these early, as soon as the ground opens, and all at the same time and they will mature in order given providing an abundant, mouth-watering crop from June to late August.

Schling's Pedigree Extra-Early—Height, 2½ feet.
Gradus, or Prosperity—Height, 3 feet. Delicious flavor.
Sutton's Excelsior—Height, 1½ feet. Very sweet.
Dwarf Champion—Height, 2½ feet. Heavy cropper.
Improved Telephone—Height, 5 feet. Enormous pods.
Heroine—Height 4 feet. The latest to mature.

1-2 lb. each of all 6 varieties, 3 lbs. in all $1.75
1 lb. each of all 6 varieties, 6 lbs. in all 2.75
2 lbs. each of all 6 varieties, 12 lbs. in all 5.00

(Free delivery within 30 miles of New York; beyond, add 5 cents per lb. for postage.)

Here is our big value

"Get Acquainted" Collection

of Rare and Delightful Flowers

A $3.25 Value for $1.00

Schling's American Beauty Aster—Gigantic flowers, 7 inches across, 3 ft. stems, "American Beauty" rose. Pkt. ..... $.35
Schling's New Orange Glory Calendula—Golden orange perfect form. Very double. Pkt. ..... $.25
Schling's New Annual Double Fringed Hybrid Chrysanthemum—In a charming color range, Pkt. ..... $.15
Schling's Semi-double Crested Cosmos—Of giant size with double rosette-like center. Pkt. ..... $.25
Schling's New Hybrid California Poppies—Lovely new shades of pink, scarlet, chrome, copper red, claret, purple, etc. Pkt. ..... $.25
Schling's New Giant Hyacinth Flowered Larkspur—Excels all others in length of stems, size of flower spikes and general vigor. Pkt. ..... $.35
Schling's New French Marigolds—Glorious—Rich velvety brown, blotched on brilliant velvety scarlet. A gem. Pkt. ..... $.75
Schling's New Erysimum, Orange Beauty—Pale orange-yellow spikes. Delightfully fragrant. Pkt. $.25
Schling's New Giant Early Flowering Pansy—World Record—Flowers of immense size on long stems. In bloom from March to December. Pkt. ..... $.25
Schling's New Marvelous Dahlia-flowered Zinnia—True Aristocrats. Flowers 6 to 7 inches. Pkt. ..... $.40

Many other garden delights in our Book for Garden Lovers, 35c a copy. Free with first order.

Schling's Seeds

Max Schling Seedsmen Inc.
618 Madison Ave., North New York City

Choose from Our 75 Varieties of Beautiful WATER LILIES

These richly colored, fragrant, easy-to-grow garden flowers may be planted from April until the last of August. Ours are the largest Aquatic Gardens in America. Every root *guaranteed!* 75 beautiful Varieties from which to make your choice in our free, illustrated Catalog. Send for it NOW.

The W. B. SHAW Aquatic Gardens
Dept. A, Kenilworth, Washington, D. C.

Let NATURE MAGAZINE *Advertisers fill your garden needs*

Biological Survey Report

That the first requisite in wild-life administration is an adequate knowledge of all the facts regarding the wild animals and birds of the country—their relationships and economic value, their habits, and their abundance—is stressed by Paul G. Redington, chief of the Bureau of Biological Survey, in his report to Secretary Hyde of the U. S. Department of Agriculture on the work of the Biological Survey for the fiscal year ending June 30, 1929. Only with such facts known, says Mr. Redington, can the wild life of the country be administered on a sound scientific basis and the harmless and useful species protected and those that are economically injurious controlled.

"Although economic considerations should by no means be allowed to outweigh all others that are advanced for the welfare of wild life," says Mr. Redington, "they have a proper place in every measure considered for wild-life conservation, for man must in many places subdue nature and make it serve his purposes. Fields must replace large forest areas, and domestic livestock must supplant most of the wild ruminants, predatory animals, and injurious rodents. In the process whereby civilization, either intelligently or wantonly, is changing natural conditions, the wild life, wisely preserved and controlled, can be made an asset of great value, not only of economic but of esthetic and scientific importance, and the natural habits of many species may themselves be utilized in numerous ways."

Goddess or Glutton?

Further habits and traits of Miss Phengodes, the subject of an article in October Nature Magazine by Samuel H. Derickson, are revealed by Mrs. Jesse E. Correll, of Webster Groves, Missouri, who found the pretty little lady in the new rôle of a militant warrior. "It was a battle to death," she relates. "The long, drab millepede and the gaily dressed smaller 'worm' wrapped about each other and rolled about the glass where Skipper and Ginger had placed them. The war was still raging an hour later when it was time for us to leave camp, so Ginger put the contestants in a paper bag to carry in the automobile. Suddenly she uttered a cry, 'Mother, it's a glow-worm!' And through the paper, a soft glow showed the outline of the body of the black and tan 'worm.'

"At home, Ginger flew to the October Nature Magazine and checked point by point until Miss Phengodes was clearly identified. On her knees before the glass which had become a jewel casket, the child agonized. 'If the big one kills the small one, I'll never forgive myself for not separating them; but if the small one kills the big one, she will eat it and we shall know her natural food. What shall I do?' Scientific curiosity triumphed and the two stayed together. Morning light disclosed a new page in the history of Miss Phengodes for she was breakfasting magnificently upon millepede. The head had been bitten off and cast aside and, as she ate, the lovely glutton crawled inside the shell of her prey. Three segments had already been emptied. We dragged the glow-worm from her meal long enough to measure each. The millepede, without its head, was two and three-quarter inches and Miss Phengodes ex-

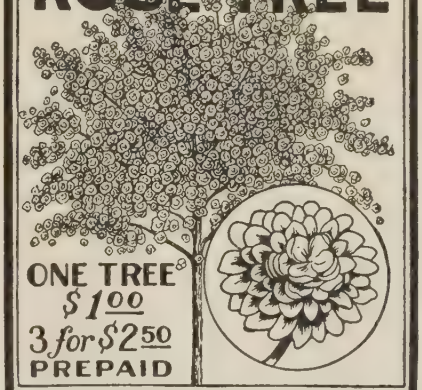
Dreer's Garden Book

"I ALWAYS go to Dreer's" is the explanation you invariably get when you admire a neighbor's garden. Why not insure your own success with Flowers and Vegetables by selecting them from our 1930 Garden Book?

A copy free if you mention Nature Magazine

HENRY A. DREER
1306 Spring Garden St.
Philadelphia, Pa.

ROSE TREE



ONE TREE $1.00
3 for $2.50
PREPAID

The ROSE TREE OF CHINA (Prunus Triloba) is the most beautiful and showy of all small trees. It begins to bloom before the leaves appear in the spring, being literally covered with very double rose-like pink flowers. As an ornament from early spring until late fall it has few equals. This symmetrically formed, graceful little tree grows usually to a height of but 8 feet, and is attractive as a specimen or when planted in groups or shrub border. It is hardy and easily grown, and no lawn is so small that room can not be found for at least one of these wonderful trees. Many who have seen it declare it to be the most beautiful tree they have ever seen. The rose-like blossoms make fine cut flowers.

Choice trees for **$1.00 each; 3 for $2.50,** by parcel post, postpaid.

SPECIAL For **50c** extra we will include three small **TULIP TREES**—fine ornamental shade trees with tulip-like flowers.

Our stock of trees will not last long at these low prices. Order now, and state when you want trees shipped. CATALOG FREE. **BURGESS SEED & PLANT CO., 340 T. T., GALESBURG, MICH.**

100 EVERGREEN TREES $3.50

Buy From Grower At Wholesale

Western Maine Forest Nursery FRYEBURG MAINE

Beautify your home with these vigorous hardy trees, four years, transplanted and well rooted. Average height 4-8 inches. Started in severe Northern climate, they will thrive anywhere and grow rapidly.

NORWAY SPRUCE — SCOTCH PINE
WHITE SPRUCE — NORWAY PINE
100 of any variety or 25 of each kind $3.50

Because of the late Northern spring, these trees are dormant until May, and can be planted with success in any climate. Order now for Delivery about May 1. No shipment of less than 100. Average weight 10 lbs. per hundred. Remit with order.

WESTERN MAINE FOREST NURSERY
Dept. C — FRYEBURG, MAINE

Send for Descriptive folder

Berry Bearing Shrubs

ATTRACT THE BIRDS

Beautify your grounds. Furnish food for the birds. Varieties recommended by the Audubon Bird Society include Snowberry, Coralberry, Bush honeysuckle, Siberian dogwood. ORDER NOW: 11 Sturdy, well rooted plants 2-3' for $5.25 postpaid. 14 Sturdy, well rooted plants 18-24" for $4.75 postpaid. Check bargain collection wanted, cut out and mail with check or money order. Write name and address plainly.

PIEDMONT FORESTRY CO., BOUND BROOK, N. J.
Send for Catalogue

Walsh Garden Tractor
and Power Mower

For Gardeners, Florists, Fruitmen, Suburbanites
Plows, Seeds, Cultivates, Mows Lawns & Hay
Single & Twin Engine-Belt Jobs-Walk & Ride
SPECIAL FACTORY PRICE
New Improved Models — *Catalog Free*
WALSH TRACTOR CO. Minneapolis, Minn. 3324 Talmage Av. SE

750,000 GOOD GLADIOLUS

American and foreign introductions. 100 small blooming size, assorted colors, postpaid anywhere, $1.50. Catalog free. A. G. S. gold medal winners.

DODROPIN GLAD GARDENS
332 N. Main Street — Lewiston, Idaho

This book tells how

"How to Landscape The Home Grounds" is written *specifically* for those who wish to landscape their own grounds without the aid of a professional Landscape Architect.

It was compiled by a prominent Landscape Architect and is written in simple language that anyone can understand.

EACH STEP ILLUSTRATED

Simple charts and drawings show you each step from start to finish. Plans and cost estimates for every type of home are included.

This book tells in detail how to arrange trees, shrubs, vines, etc.; how to make an Outdoor Living Room or a lovely Rock Garden, and how to choose exactly the right variety for each location.

SEND ONLY 10c

THE STORRS & HARRISON CO.
Box 128 — Painesville, Ohio
Gentlemen: I enclose 10c for booklet "How to Landscape The Home Grounds."

Name_____

Address_____

10 Gladiolus Bulbs 10¢

Choice mixture of colors; finest named varieties; **blooming size.** 10 for **10c**; 50 for **50c**; 100 for **$1.00**; postpaid.

Regal Lily 10c

The finest of all Lilies, hardy everywhere. Immense clusters of flowers, with individual blooms 6 inches in length; stems 4 feet tall; color, white, slightly suffused with pink and a beautiful glow of canary yellow at center. One year old bulbs **10c** each; 15 for **$1.00**, postpaid.

Blue Spruce 75c

4-year old trees . . . 3 for $2.00, prepaid.

Catalog Free

Burgess Seed & Plant Company

Dept. 340 B. B.

Galesburg, Michigan

GARDEN FURNITURE

Send 10c for BETTER BUILT CATALOG showing almost one hundred attractive pieces for lawn and garden.

Satisfaction Guaranteed

IOWA MANUFACTURING CO.
979 Third Street, SAC CITY, IOWA

GLADIOLUS BOOK FREE!

Send for my new 36-page Gladiolus Book, describing 175 exquisite varieties, many new. Tells how to grow. 45 illustrations. It's free!

My famous beautiful RAINBOW COLLECTION will delight you. 1 bulb each of 30 varieties (not labeled) all colors, blooming size, planting hints included, satisfaction guaranteed, $1.00 postpaid.

H. M. GILLET, Gladiolus Specialist
Box 458 New Lebanon, N. Y.

DAHLIAS

BARGAIN OFFER

5 Glorious Beauties for $1.00

Pride of Conn. Pink.
Kalif, Red.
Mrs. I de ver Warner, Orchid.
Etendard de Lyon, Purple.
Jean Chazot, Orange.

$2.75 worth of Dahlia tubers for $1.00

Send for interesting free catalogue.

C. LOUIS ALLING

Dahlia Specialist

251 N. Court Street West Haven, Conn.

SHELLS Send one dollar for box of Florida sea shells or two dollars for a stuffed alligator.

GIFT & PHOTO SHOP
P. O. Box 1958 Fort Myers, Florida
Correspondence from Collectors Solicited

tended and crawling was two and one-half inches long. When the two were replaced in the glass, the meal was resumed to continue for three days and three nights. When only a half inch of the millepede remained, Miss Phengodes took a long breath and burrowed into the dirt which filled the lower half of the glass.

"To sleep off such a gluttonous meal seemed quite natural, but when two days passed and no glow-worm appeared, we became concerned. Careful examination of the dirt in the glass disclosed no glow-worm. We had under-estimated her strength and a pushed-up place in the paper which, secured by a rubber band, covered the glass, showed us the way she had gone."

Exotic Game Birds

W. L. McAtee, Senior Biologist of the U. S. Bureau of Biological Survey, has written a pamphlet entitled *Game Birds Suitable for Naturalizing in the United States,* published by the Department of Agriculture as Circular No. 96. In this circular Mr. McAtee discusses the species recommended for introduction and those considered undesirable, and makes suggestions as to habitat and method of naturalization. In his introduction to the circular, Mr. McAtee says:

"Sportsmen share the admiration of Nature students for native game birds and will cooperate to the fullest extent in preventing their extermination, but they see the necessity for using exotic species also if the game supply is to be maintained or increased. Such increase is widely demanded and will continue to be demanded, and to effect it necessitates the fostering of birds that respond most profitably to game-propagation methods. Where native game birds are abundant there is little or no need to plant exotic species; but where native species do not supply the demand, foreign game birds are being introduced. Let the native game birds enjoy the protection of game sanctuaries as numerous and extensive as can be afforded, but on those parts of our domain where public shooting is practiced and its continuance is desired, the practical necessities of the situation require the use of species of game birds that will produce the best results, regardless of their origin."

Park Nature Notes

One of the most successful features of National Park Service administration has been the issuance, from a number of the parks, of monthly bulletins under the title "Nature Notes." These contain interesting news items of happenings in the park, and feature articles on game, geology, or flowers, and besides being interestingly written, are extremely valuable from the scientific point of view. Yosemite, Crater Lake, Mount Ranier, Yellowstone, Rocky Mountain and Grand Canyon National Parks have issued such bulletins for some time, and Dr. G. C. Ruhle established the practice at Glacier. Individuals interested in receiving these bulletins may be put on the mailing list by writing to the superintendents of the parks. The cost of postage must be paid for Yosemite Nature Notes, but the others are distributed free of

$1.00 GLAD Offer

Collins ROSES

36 big plump bulbs, 2¼ to 5½-inch circumference. **GUARANTEED** to bloom this year. Big blooms—all colors and types—not usual small-flowered mixture. Includes dark garnet-red "Neog," ruffled; salmon pink "Mrs. Frank Pendleton"; maroon-blotched; and rare orchid and pastel colors. 36 bulbs only $1.00 prepaid.

GIVEN WHILE THEY LAST

36 additional big bulbs, large-flowering glads with each order of these glads and roses totaling $2.95.

"FAULTLESS FIVE"

Sturdy 2-yr. FIELD-GROWN Bushes—finest monthly varieties **$1.95** Postpaid

Shell Pink Radiance—silvery pink; **Lady Hillingdon**—apricot-yellow; **Kaiserin Augusta Victoria**—perfect white; **Columbia**—rose pink; **Hadley**—velvet crimson.

They bear long-stemmed fragrant blooms all summer and fall.

ACT NOW! Limited supply only. Send $1.95 today. Bushes mailed POSTPAID when planting season opens. Beyond Mississippi River, add 20c.

1930 Guide Free—describes 70th Anniversary BONUSES

Collins Nurseries, Box 96
Established 1860 MOORESTOWN, N. J.

Evergreens and Birds

Pines, Hemlocks for nesting sites. Juniper berries for food. Watch the plants grow tall, then watch the birds come. ORDER NOW: 12 Healthy, transplanted plants 10-12" high $5.25 postpaid.

Send For Catalogue

PIEDMONT FORESTRY CO. Bound Brook, N. J.

NEW YELLOW ASTER FREE!

I am developing a new **Yellow Aster,** a New-Comer in Floriculture, and I call all Flower Lovers to my assistance in order to test it in all soils and climates.
I will send a **sample packet (25 to 40 seeds)** free to anyone who will grow them and report success.
I will also send my **1930 Bargain List** of **Seeds, Bulbs** and **Plants,** illustrated in colors listing **42 Bargain Offers** that cannot be obtained elsewhere. Write today for this **Free Yellow Aster Seed** and **1930 Bargain List.**

F. B. MILLS, Seed Grower, Dept. B, Rose Hill, N. Y.

What makes a good
PLANT LABEL GOOD?

It must be impervious to moisture, must retain its markings, and must not girdle the Plant—WE HAVE IT.

Sample Line for the Asking

THE AQUAPROOF PRODUCTS CO.
2175 East 76 St. Cleveland, Ohio

KINKADE GARDEN TRACTOR

and Power Lawnmower

A Practical, Proven Power Cultivator for Gardeners, Fruit Growers, Truckers, Florists, Nurserymen, Suburbanites, Country Estates and Poultrymen.

New Low Prices - Easy Terms
AMERICAN FARM MACHINE CO
1036 33rd Ave., S. E., Minneapolis, Minn.

Catalog Free

ROSE GUIDE FREE

"NEW GUIDE TO ROSE CULTURE," our beautiful manual, shows many roses in natural colors. New and old varieties. Write for your copy—it's free. Lists 500 roses and other plants. Gives hints for care and planting we have learned in 80 years. Invaluable to beginners. Special offerings will interest you. Send today! *Address*—

THE DINGEE & CONARD CO., Box 307, West Grove, Pa.

DINGEE ROSES

WATER LILIES

Gold and Tropical Fish

Everything for the water garden. Our free Catalog contains much valuable advice and many illustrations.

BELDT'S AQUARIUM
2141 Crescent Ave.
St. Louis, Mo.

harge. As an experiment, a number of imeographed leaflets containing informaon on geology, wild life and other phases Natural History were prepared at Crater ake, and distributed to the visitors, who ceived them enthusiastically. It is interting to discover that more and more tention is being paid to the educational atures of the parks, and that the reaction the public is decidedly favorable.

Report on Chipmunks

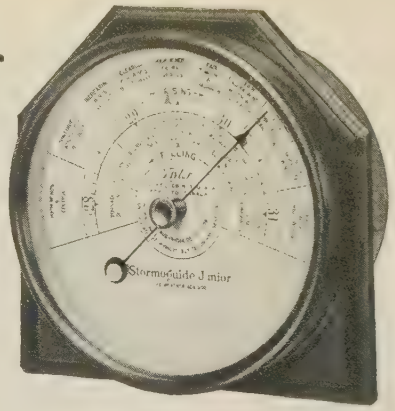
In the report entitled "Revision of the merican Chipmunks," Arthur H. Howell as gathered together the latest information elative to the Genera Tamias and Eutamias. peaking of the economic status of these nimals, he writes that "the eastern chipunks occasionally damage grain in the elds and dig up and eat corn and other lanted seeds, but in the main their habits n relation to agriculture are neutral. The estern chipmunks, living as they do rgely in mountains and the wilderness, reote from agricultural sections, also are ainly neutral in their relation to man's nterests. Occasionally, however, where heir habitat borders on cultivated fields, hey do some damage locally to crops. . . . hey sometimes prove troublesome on areas hat have been planted for reforestation by ating the tree seeds. If chipmunks are bundant in regions where forest planting is eing carried on they frequently eat or ary off a good share of the planted seeds, nd it has been found necessary in order o insure a successful stand first to reduce he numbers of chipmunks by trapping or oisoning. Under natural conditions they pparently have no harmful effect on forest growth."

Copies of the new report, North American Fauna No. 52, may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 35 cents each.

A Battle Royal

An unusual struggle to the death between a tarantula and a tarantula hawk is recorded by Miss Winnie E. Wheeler of Tucson, Arizona. When discovered, the tarantula was taking an evening stroll on the walk, while the hawk was hovering nearby. The hawk, or wasp, began to walk around the spider, although beset by the difficulties of water on the walk and grass nearby—then suddenly she flipped herself on her back, pushed herself underneath the tarantula and stung him. The tarantula tried to fight back, but the wasp quickly got beyond reach and, after nursing her wounds for a minute or so, was back at the attack. Again she performed her stinging act, preceded by circling the tarantula and teasing him to attack. This time the tarantula hardly fought back and soon became motionless. The wasp walked some distance away, cleaned herself thoroughly, then started off in a definite manner toward the grass. Soon she returned, and grasping her fallen foe, she began dragging it backwards. She crossed the walk, then started for the other side of the street. Many adventures she had in making the journey, but Miss Wheeler and her friends saw her safely reach the other pavement and disappear into the grass, with her conquered victim rudely dragged behind.

Advance Weather Information



. . and for only $10, too!

ALL scientific weather forecasting is based primarily on atmospheric pressure. You can have in your home a Taylor Stormoguide (Simplified Barometer) that will indicate this pressure and translate its meaning into simple, everyday weather information, good for twelve to twenty-four hours in advance.

Taylor Stormoguide Junior, with its easy reading dial and handsome bakelite walnut case, has a very definite use in every phase of your out-of-door plans. Consulted often, it will enable you to take advantage of favorable weather conditions,—warn you in advance of poor.

Built on correct scientific principles, by a firm who has specialized in accuracy since 1851, Stormoguide Junior is an inexpensive but reliable weather forecaster. Not a toy, it will last for years. Used in the house, no need of going outside to consult it.

Taylor STORMOGUIDE JUNIOR

will give you years of faithful service. There is nothing about it to wear out. It requires no winding or other attention. Once hung on your wall, it will be a source of help and pleasure for a long time to come.

Taylor Stormoguide Jr. has a 4½-inch white, easy reading dial and is adjustable for altitudes 0 to 2500 feet. It is suitable to use on the wall or to stand on table or shelf. It is procurable almost everywhere, but if you are remote from a dealer, use the coupon below, and Taylor Stormoguide Junior will be sent direct to you, safe delivery guaranteed. Price each.....$10.

Taylor Instrument Companies

ROCHESTER, N. Y., U. S. A.

CANADIAN PLANT
TYCOS BUILDING
TORONTO

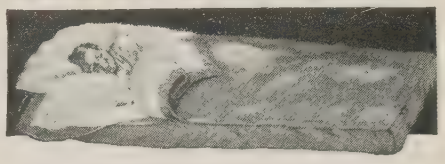
MANUFACTURING DISTRIBUTORS
IN GREAT BRITAIN
SHORT & MASON, LTD., LONDON

Taylor Instrument Companies
89 Ames Street, Rochester, N. Y.
Enclosed is $10. Please send me one Taylor Stormoguide Jr. I understand you guarantee safe delivery.

Name .....
Address .....
Town ..... State .....

WOODS ARCTIC DOWN SLEEPING ROBES

Gobi Desert or Gander Pass



Wherever you are you SLEEP!

WHEN bedtime comes, wherever you are there is rest and comfort galore in the warm, downy folds of your Woods Arctic Down Outdoor Sleeping Robe. Under you, over and all about you, Nature's best insulation—the down of Northern waterfowl. Famous for remarkable range of temperature accommodation.

Wilderness bivouac or country home sleeping porch, lakeside cabin or mountain shanty —the Woods Arctic or Arctic Junior always insures you real *sleep* in comfort, no matter what the weather may be.

Used by the Byrd Antarctic Expedition, the Roosevelts and by other leading explorers for many years. Made flat like a blanket —buttons to form a bag as shown, closing with a wide underlap. Rainproofed windbreaker-fabric cover. Lining, finest obtainable pure virgin wool kersey or English army flannel. The world's warmest yet lightest outdoor sleeping robe.

Sold by leading sporting goods stores and departments. If not displayed, please write to us. Illustrated folders, giving full details, guarantee and prices, mailed on request.

WOODS MANUFACTURING CO., LTD., 3012 Lake St., Ogdensburg, N.Y., in Canada, Ottawa, Ont.

Please tell the Advertiser you buy through NATURE MAGAZINE'S *columns.*

"I Was Imprisoned —For Life!"

"The knowledge came to me suddenly. Every plan I made to widen the activities of my life, broaden my rightful privileges, and gain success and happiness, was checked by the wall that surrounded me.

"For years I was unaware of this great wall. I thought that I was A FREE BEING and enjoying all the blessings of life. Then came the realization of why I was poor, unsuccessful, limited and unhappy. I FOUND the PATH TO FREEDOM."

FREE BOOK BRINGS FREEDOM

The Rosicrucians have been devoting their lives for many centuries to breaking the bonds that hold man in their power. They have issued a private book that will tell you how you can OVERCOME the OBSTACLES in LIFE, use a new mental power to create a larger, happier career and attract success, health, and prosperity. It means the dawn of a new day—the beginning of perfect freedom. Send for a copy today. It is absolutely free. Write a letter (not a post card) to:

LIBRARIAN W. F. I.
THE ROSICRUCIAN ORDER
(AMORC)
SAN JOSE CALIFORNIA
(The International Rosicrucian Order)

California Quail Victorious

Twenty-two birds were selected as eligible for the honor of being designated a State Bird of California and were placed before the people of the State, without prejudice and on an equal basis, by the California Audubon Society. Then there ensued an excellently administered poll for the selection of the favorite bird. With a total of about 150,000 ballots cast and sent in, the California quail was a safe winner when the voting closed, getting about one-half of the total cast, with the balance variously divided among the other contestants. Naturally the poll has been of outstanding educational value in the State and has awakened widespread interest in birds and bird protection.

School of the Air

It has just come to our attention that a fine educational activity is going on in Ohio under the title of the "School of the Air." The last Ohio General Assembly made a special appropriation to cover a two-year program under the State Department of Education for the broadcasting from Station WLW, Cincinnati, subjects of grade and high school level. This takes place from two to three on the afternoon of each school day, twenty minute periods being devoted to each subject. Mondays from 2:20 to 2:40 the Nature period is presented. Many schools have installed receiving sets and have enrolled in the new educational activity, which has most interesting possibilities.

Wild Rice

Miss Charlotte Riemer gives below an interesting account of one of the legends concerning the discovery of the food value of wild rice.

"In visiting the lake region of northern Minnesota we saw great quantities of beautiful, feathery grass growing in the thousands of lakes for which that section is noted. It swayed in the breeze, reminding us of fields of grain on dry land, and when we asked our Indian guide what it was he said 'wild rice,' and later he told us a very interesting legend about the discovery of wild rice.

"Long ago a young Chippewa brave set out to spend some time in the wilderness where he would be cast upon his own resources for food and shelter and protection. This custom was followed by many of the young men as it taught them to depend upon themselves and to become self-reliant. This youth wandered in the forest for many days, subsisting on such food as Nature yielded and upon the flesh of the animals he was able to shoot or snare.

"After a time food became scarce and he was forced to eat some unknown roots which made him very sick. After that he was exceedingly careful what he ate and he sometimes went hungry rather than to eat strange fruit and tubers.

"One day he came to a lake in which was growing a strange, feathery grass. He was attracted by the beauty of the plant and as the lake was too deep and muddy

for him to wade into the water he fashioned a canoe from the bark of a birch tree that grew on the bank of the lake and paddled out upon the water and gathered some of the grassy stalks. He had never seen the plant before or heard of it so he did not know it was useful for food, but he admired its graceful beauty and gathered some of it to take back to the tribe. Later the squaws planted the seeds of the grass in another lake near their wigwams that they might all enjoy its beauty.

"When the rice which the squaws planted had grown to maturity a very wise old Indian, who had traveled much, visited this particular settlement and when he saw the wild rice he cried, 'Manomin, Manomin'. And then he told the Chippewas that Manomin (or wild rice) was good to eat.

"To-day many of the lakes and swamps of northern Minnesota yield prolific harvests of wild rice which the Indians go out in boats and gather. A canvas is spread in the bottom of the boat and the waving stalks of rice are bent over the edge of the boat and beaten on to the canvas with sticks.

"Most of the rice obtained by the Indians is sold to the summer hotels which abound in that region. These 'resorts' are much frequented by tourists from all over the country who come there for the fishing and hunting season and to enjoy the delightful summer climate. The hotels serve the rice to the tourists at exorbitant prices for the tourists consider it a great luxury when well cooked and served with game and other meat dishes."

Skeleton Leaves

We are indebted to W. J. Edmonds, Jr. of Whitehall, N. Y., for the following information on preparing skeleton leaves:

A method of preparing skeleton leaves quite as efficient and not so offensive as the old method of maceration is as follows.

First, four ounces of ordinary washing or sal-soda crystals are dissolved in sixteen ounces of boiling water, to which is added two ounces of slaked lime; then the mixture is boiled for fifteen minutes and allowed to cool. After cooling the solution is filtered into another container. This clear solution is allowed to come to a boil and the leaves are carefully immersed in the same and allowed to boil for about one hour, water being added from time to time to compensate for the water lost during the boiling.

The epidermis and cellular tissues of some leaves will more readily separate than others. Should they not rub off easily between the fingers, the leaves should be allowed to boil longer. When the fleshy matter is found to rub off easily between the fingers each leaf should be separately rubbed beneath cold water until the complete skeleton is exposed.

After the above process is carried out, the leaf skeletons will be found to be of a dirty white color. To make the skeletons a clear white color they may be bleached in a weak solution of chloride of lime.

A tablespoonful of chloride of lime is added to a quart of water to which a few drops of acetic acid or vinegar are added to liberate the free chlorine. The dirty white skeletons are placed in this solution for a few minutes

THE GREATEST LESSON IN LIFE!

School Teachers encourage Roller Skating—Doctors recommend it. But greater health benefits are derived when **Noiseless "CHICAGO"** Rubber Tire Skates are used.

for HEALTH'S Sake ROLL ON Rubber — And Get Higher Marks!

Movie Stars prefer the better Skates for Health and Pleasure. Below Clyde Cook and Leila Hyams enjoying their new **"CHICAGO"** Rubber Tire Roller Skates.

FREE! Book tells how to start, stop with 4 wheel brakes, position of feet and body. Also games, etc.

"CHICAGO"
TRADE MARK REG. U.S. PAT. OFF.
Rubber Tire Roller Skates
"Speed Without Noise"

Play outdoors — Roller Skate for Health! You'll enjoy games, races, hikes as you never did before when you use **"CHICAGO"** Roller Skates.

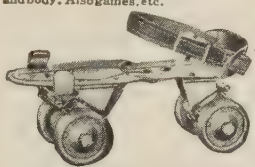
The easy running ball-bearing wheels spin 10 times longer —the hard composition rubber tires are noiseless and outlast steel wheels 2 to 1. Be sure you get **"CHICAGO'S".**

Thousands of children and even grownups are wearing this beautiful gold finish Club Pin.

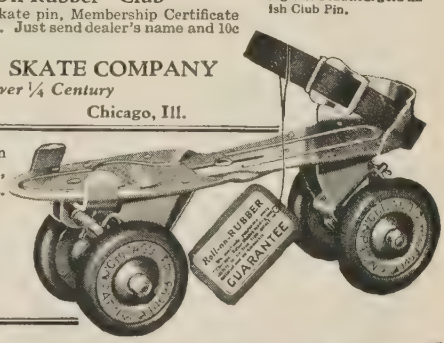
Join The "Roll On Rubber" Club

Get this beautiful gold finish skate pin, Membership Certificate and Book "How to Roller Skate". Just send dealer's name and 10c to cover postage. Write Today!

CHICAGO ROLLER SKATE COMPANY
Established Over ¼ Century
4451 W. Lake Street Chicago, Ill.



No. 101 New Double Tread "Triple-Ware" Steel Wheel Skate. Will outlast any other Steel Wheel Skate made 3 to 1. Finest Ball-Bearing Wheels spin 10 times faster and guaranteed not to come apart. **Price Only $2.25.**



No. 181 Combination Super Skate for Boys, Girls and Grownups.
Price $4.00

From Your Dealer or sent direct Postpaid on receipt of price and dealer's name.

CANADA TAX SALE

SEIZED AND SOLD FOR TAXES

$77 buys 3 acres large lake front
$126 buys 40 acres farm
$158 buys 82 acres on river
$270 buys 160 acres with creek
$360 buys 100 acres lake front
$389 buys 200 acres Otter Creek

These properties, with several hundred others, are offered at the prices stated, no mortgage, no further payments. Beautifully situated hunting camps and fishing lodges where there is real hunting and fishing. Summer cottage sites; heavily wooded acreages situated in Muskoka, Highlands of Ontario and the new North; also farms in Old Ontario, New Brunswick, Quebec, Prairie Provinces and British Columbia. Our 13th annual list just issued in the form of a twenty-page, illustrated booklet describes these properties and gives full particulars. It is mailed free on application. Now is the time to invest in Canada's minerals, forests and farms. Don't delay! These properties won't last long at these prices. Send no money, but send for booklet to-day so you will have first choice.

TAX SALE SERVICE
Room 615
72 Queen Street West, Toronto 2, Canada

WHEN THIS BOAT COMES PUT-PUT PUTTING HOME . . .

THERE'LL be a warm frying pan ready. For it's a sure bet there'll be fish to fry when you go in a motor-driven "Old Town." You motor in an "Old Town" to your favorite spot . . . you're there in time for the fishes' breakfast . . . and *they're* back in time for *yours!*

"Old Towns" are wonderfully fleet and sturdy craft. Durable—built for heavy loads, but easy to handle. With sponsons if you like. Free catalog shows and prices many models — rowboats, dinghies, all canoe types; big, fast, seaworthy, all-wood, outboard boats for family use, and speedy step-planes. Write today. Old Town Canoe Co., 183 Main St., Old Town, Maine.

"Old Town Boats"

AT LAST—The 6-in-1 Six Color Pencil

Operating through the one barrel, this unique pencil writes in the six colors—**Red, Green, Blue, Black, Yellow and Purple.** Colors easily interchangeable. A practical necessity for Students, Office Workers, Checkers, Teachers, Clerks, Artists, Architects, Draughtsmen and all business and professional people. *Only One of Its Kind.* It is furnished with an ample supply of extra leads. Fully guaranteed to please you or money refunded. *Sent Prepaid for $1. Agents Wanted*—Full or part time workers—men, women, boys, girls. Send $1.00 for sample pencil and ask special agent's price. JERRIDE SPECIALTY CO., Room 1608-26, 104 Fifth Ave., N. Y.

30 Days' Free Trial
on all MEAD Bicycles

New **RANGER Models** now ready for delivery direct from our factory. *Astonishing* **new prices** and terms. Do not buy until you get them. **RIDER AGENTS WANTED** to ride and exhibit sample. Save big money. Many models, styles.

Tires wheels, lamps, horns, equipment at *half usual prices.* **Easy Payments.** Write for our **marvelous prices and terms.**

Mead CYCLE COMPANY DEPT. L 124 CHICAGO Write us today for free catalog

Rough and Polished Minerals

We are dealers in minerals and polished semi-precious stones catering only to those who are interested as collectors, students, teachers, naturalists, curators or craft workers. We try to stock all varieties of polished semi-precious stones, genuine mined material only and correctly classified. Price lists, circulars and approval blank upon request.
The Gem Shop, Box 380, Wolf Creek, Montana

Joseph H. Dodson

A SIMPLE Way to Bring the Song Birds

America's foremost bird authority for 50 years, has written an interesting book, beautifully illustrated with 55 actual photographs "Your Bird Friends and How to Win Them." Tells you how to have birds on your premises the year round—explains styles of houses, baths and shelters they prefer. Send for this FREE book today.

Queen Anne Martin House

Flicker House

Birds are useful. They keep the garden free from cut worms, bugs, moths and other destructive insects. Martins feed from the air. One colony will destroy thousands of mosquitoes a day.

Birds Bring Cheer

A medley of bird songs will add to the attractiveness of any home. Naturally, birds go where they are most welcome—have good places to nest, plenty of fresh water and are not molested by their enemies. Write for free book.

Wren House

JOSEPH H. DODSON, INC.
225 Harrison St. Kankakee, Ill.
Dodson Bird Houses are priced from $2 to $150

Be a Taxidermist Learn by Mail

Learn to mount all kinds of game, birds, animals, fish—tan furs, make rugs, robes, etc. **You can now learn this fascinating art in your own home during your spare time.** The lessons are interesting and easy to understand. Great sport and lots of fun. Big money for your spare time.

Mount Your Own Specimens

Decorate your home with beautiful specimens that you have caught and mounted yourself. **You can make big money** doing the work for others. Many specimens are becoming very rare and sell for high prices. Over 100,000 students have learned taxidermy through our lessons. One student writes us: "I have made over $550.00 during my spare time selling my specimens and mounting for others". We have thousands of similar letters.

FREE Beautifully illustrated book "How to Mount Game". Explains the secrets of taxidermy. Contains dozens of photos of mounted specimens. **Every hunter or trapper should have this book.** Tells you how you can learn this fascinating art easily and quickly from our school. Sent you absolutely free if you state your AGE. **No obligation. Write today!**

Northwestern School of Taxidermy 2943 Elwood Bldg., Omaha, Nebr.

Big fees; pleasant healthful work; a dignified, uncrowded profession offering remarkable opportunities. Immediate income possible, many students more than pay for course from fees earned while studying. Graduates are earning $50 to $200 a week. The first step toward success is to write today for details.

AMERICAN LANDSCAPE SCHOOL
Member National Home Study Council
21 Plymouth Bldg., Des Moines, Ia.

or until the skeletons show up clear white, and then removed, washed and placed between two sheets of white blotting paper and allowed to dry.

The specimens may then be mounted upon a card or sheet of white paper by means of a mucilage made up of gum arabic, one ounce, water, one and one half ounces, and corrosive sublimate, two grains.

Care should be taken, in collecting leaf specimens for this purpose, for the time of year and the condition of the atmosphere must be considered; otherwise failure will result. The best months in which to collect the leaves for this purpose are the months of June, July and August. The leaves should not be collected in damp weather and nothing but mature leaves should be taken.

Saving Trees

Occasionally it happens that an inexperienced person is called upon to play the part of a doctor to save human life, but less frequently does the layman attempt to practice the art of the tree surgeon in saving trees. Mrs. Horace P. Cook of Anderson, Indiana, however, used a little of that rare commodity, common sense, to preserve a beautiful *Catalpa bungei* or umbrella tree that stood in her yard. A large branch had been broken from it and was hanging by the bark. A tree expert decided that amputation alone would be efficacious. Mrs. Cook, not wishing to lose the limb, bent it back into position, first tucking all the splintered wood inside the bark, then fastened it in place and bound the wound with bicycle tape. She covered the entire patch with sticky material to keep out insects.

In a few days, the leaves began to wilt, and some of them came off, and she deemed her experiment a failure. A little later, however, the withered leaves came back to life, new ones replaced those that had fallen, and Mrs. Cook knew that the limb was healing.

Her experience has led her to believe that many times valuable trees are cut down and destroyed when a little practical surgery would save them. Orchards particularly suffer from windstorms, and the broken branches could be mended, she thinks, by the method she followed with her own tree. It is a matter, she has found, of common sense.

Playful Snakes

Snakes are usually pictured as very sombre creatures, plotting from birth the destruction of the human race, as did one long ago, but the observations of Gertrude A. Heath of Hayden, Arizona, may go far to dispel the long existing stereotype. One day in fall, she and her brother discovered a beautifully marked green, white and black striped snake basking on a board in the sun. Hardly had it been found, than another of the same species appeared, and pounced on the first. The two rolled and tumbled around like a pair of puppies playing—first one tried to tie knots about the other, then they would become an entwined ball, then they would cease the struggle and stretch out on the board in the sunlight. This inaction would disappear in a flash and again the battle

BIRD HOUSES

No. 23 is a very ornamental hanging blue bird or wren house. Length 18" overall. Weight 8 lbs. Stained brown only.
Postpaid **$4.50.**
ASK FOR CATALOG showing a full line of bird houses, feeders, and bird baths; also sundials, lily pool and garden ornaments in iron and terra cotta.

A. H. PATCH, INC., *Craft Dept.*
3 Black Hawk Park Clarksville, Tenn.

Rustic White Cedar, Woodpecker, Bluebird, Wre
—3 Houses $3.95. Delivered by prepaid Parcel Pos
—East Miss.
Catalog on Rustic Fences and Furniture
New Jersey Fence Co., Burlington, N. J

HANDBOOK OF TREES

With 891 illustrations which enable one to identify all of the trees east of the Rocky Mountains and north of the Gulf States at any season.
$8 and $15, according to binding.

American Woods

A collection of actual wood sections (showing end, quarter and flat grains of each species), with text, giving uses, properties, distribution, etc. The plates in which the thin sections are mounted are removable for examination.
Issued in 14 volumes, 25 species in each. $10 and $15 per vol., according to binding. Send for list of species in each volume.

Also, Wood Business Cards, and mounts of woods for Lantern and Microscope.

ROMEYN B. HOUGH CO.
LOWVILLE, N. Y.

EVERY GARDENER AND GROWER
WANTS TO KNOW how to improve the soil and grow more and finer vegetables, more and better fruit, the finest flowers, plants, trees and shrubs, hot house methods, etc. All told by E. C. Vick in 4 new books that answer problems and assure success. Price $6. Sent free on approval, payable $1 a month if satisfied. Send name today and get books at publisher's risk. Garden folder free. THEO. AUDEL, 65 W. 23 St., New York. Dept. V25

THE AUDUBON BIRD HOUSE CO.
Meriden, New Hampshire

Makers of Berlepsch boxes, **the best nest boxes in the world, because of the peculiar shape of the cavity, resembling those made by woodpeckers, bluebirds, chickadees, etc. illustrated folder on request.**

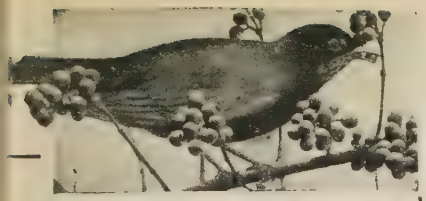
BEAUTIFUL BIRDS

Direct from the Breeder

5 Pairs Assorted for $15.00

1 Pr. Green Parakeets . . . $5.00
1 Pr. Strawberry Finches . . 4.00
1 Pr. Java Rice Birds 4.00
2 Pr. Zebra Finches 7.00
ACTUAL VALUE $20.00

All 5 pairs shipped safely to you by Express for Special Price of $15
BEAUTIFUL CANARY SINGERS . . .
Send P. O. Money Order with your order.
Send for BIG ILLUSTRATED PRICE LIST-FREE to Bird Lover
BIRD HAVEN, P. O. Box 31, RESEDA, CALIF



Bird-Lore Magazine

tells all about Birds

Official organ of the National Audubon Societies

Tells how to study birds, to make nesting boxes, feeding-stands and baths. Many illustrations, with color plate in every issue. $1.50 per year in U. S., $1.75 in Canada (6 issues). Descriptive circular free. Specimen magazine sent for 10 cents in stamps.

BIRD-LORE MAGAZINE

Box 687 Harrisburg, Penna.

FEED the BIRDS

Use the **Packard Automatic Feeder.**

Keeps food dry, avoids waste, holds a quart, weighs (packed) 3 pounds, and costs $1 and **postage. Why pay more?**

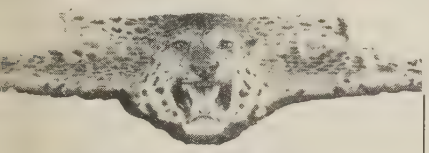
Special Mixture Bird Food

Balanced ration. Nothing else like it; nothing else so good. 10 pounds, $2 and postage.

Everything For Wild Birds
Catalogue Free

WINTHROP PACKARD

1433 Washington Street Canton, Mass.



Fur Rugs

Mounted Birds and Animals

Jonas Bros.' Rug and Trophy Catalogs illustrate Beautiful Rugs of Leopard (like engraving above), Tiger, Mountain Lion, Bear of many kinds; and Mounted Heads of Deer, Elk, Buffalo, etc.; also Mounted Birds. Specimens sent on approval to responsible persons.

Master Taxidermists

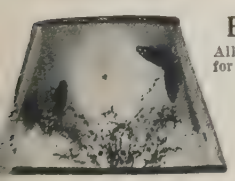
1023 Broadway JONAS BROS. Denver Colorado

Birds of Pennsylvania

By Geo. M. Sutton, former Pennsylvania ornithologist. Describes and pictures common birds of Eastern and Middle States. 144 pen sketches of birds and colored frontispiece. 176 pp., 5⅜ x 7⅝ in., strongly bound for daily use, sent postpaid for only **$1.**

J. Horace McFarland Co.

P. O. Box 687 HARRISBURG, PA.



Butterfly Shades

All materials and directions for making this Exquisite Shade 12" $5.00

Price made up—$12.50

BUTTERFLY BOX
63 Franklin St.,
BOSTON - MASS.

Send for Circular showing complete line

would be on, until time for another rest. A third and fourth snake appeared in due time, and all was merriment for some moments until, disturbed by human-caused sound, they disappeared. But not for long, for soon they were back, and the play went on, with four contestants now. It was not until thoroughly wearied that they stopped. Then one slipped away through the grass, and the other three stretched out side by side to have a sun bath.

Bay State Bird Work

Mr. L. Raymond Talbot, who will be remembered as the author of our series of foreign bird-travel stories, is now working in the schools of Massachusetts for the Massachusetts Audubon Society. He is kept busy lecturing but does find time to issue a little pamphlet called *Bird News for the School*. This is distributed by the Massachusetts Audubon Society to all High and Junior High Schools of the State.

A Convenient Fertilizer

House plants may be made to thrive by properly feeding them with a new fertilizer. This is in the form of little white tablets which are clean and odorless, called Plantabbs. One of these little tablets is equal in plant food to a large garden fork of manure. One inserted in the soil of a pot once a week will make plants flourish surprisingly. They are equally valuable around roses and other plants in the garden, also along rows of flowers and vegetables.

Self-Starting Outboards

An important development in outboartl motor history is made by the Outboard Motors Corporation, producers of the Elto line, who have added self starters on two of their outboard motor models. Any who have cranked and cranked, or pulled the cord attached to the flywheel for minutes on end, will appreciate the convenience of the new development. Elto also is building a new light model—weighing but twenty-nine pounds, which folds up to the size of a minnow bucket, and will be ideal for quick trips in small boats.

Beavers as Conservationists

In Harriman State Park, New York, beavers have given ample demonstration that as conservationists their rating is high. A series of their ponds is located on Stillwater Creek and is visible from the Seven Lakes Drive, the main motor highway between Bear Mountain and Tuxedo. The swampy forest flooded by these lakes became the haunts of many ducks, among them the rare woodduck. The shallow ponds, protected by the dams from the invasion of voracious larger fish, gave sanctuary to fry and larger young of several species of fish. The beaver have recently been moved, as they were out-eating their food supply, but willows, alders, and poplars are to be planted in their former home sites, and as soon as these are suitable for food, they will be invited back.

Best for Home, School, and Office

The Best Abridged Dictionary because it is based upon the "Supreme Authority," WEBSTER'S NEW INTERNATIONAL DICTIONARY.

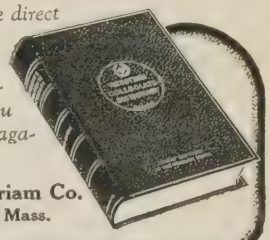
Webster's Collegiate

Contains **106,000** entries, including many **New Words:** a dictionary of **Biography; a Gazetteer;** rules of **punctuation,** use of **capitals, abbreviations,** etc.; **foreign words** and **phrases; 1,256 pages; 1,700 illustrations.**

Thin-paper edition: Special Merriam Cloth, $5.00; Fabrikoid, $6.00; Leather, $7.50.

Look for the Circular Trade-Mark.

Purchase of your bookseller; or send order and remittance direct to us; or write for information. Free specimen pages if you mention this magazine.

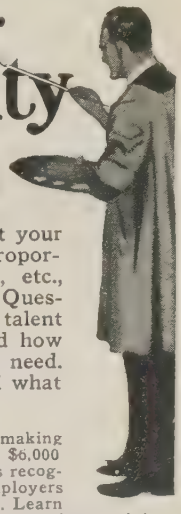


G. & C. Merriam Co.
Springfield, Mass.

WHITE COLLIE pups, the most beautiful specimens the dog world can offer, useful and intelligent. Send for Catalogue.

Comrade Farm Kennels, Galion, Ohio

Test Your Art Ability FREE



If you like to draw, test your natural sense of design, proportion, color, perspective, etc., with our Art Ability Questionnaire. Learn if your talent is worth developing and how much training you will need. You will be frankly told what your score is.

Many Federal Students are making $2,000, $4,000, $5,000 and $6,000 yearly. The Federal course is recognized everywhere by art employers and buyers of commercial art. Learn at home in spare time, without previous training. *Personal individual criticisms on your work.* Get this free test—send now for your Questionnaire.

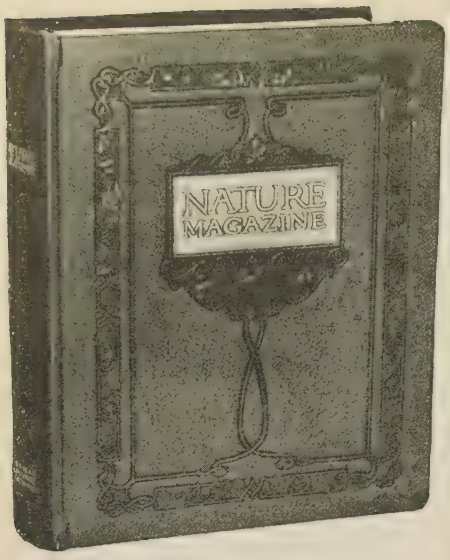
Federal School of Commercial Designing

1919 Federal Schools Bldg. Minneapolis, Minn.

Send me your free Questionnaire

Name

Address



A New Binder for Nature Magazine

Every number of NATURE MAGAZINE is worth reading again and again. For your convenience and pleasure, we have secured an entirely new binder for copies.

Grasp this opportunity for greater enjoyment from your magazines—bind them in our special two-tone, hand colored cover, embossed in gold and they will be preserved to give you a lifetime of enjoyment.

Many requests make it possible for us to offer you these artistic, leather-like covers, pictured above, especially created for our members, in which you can insert each issue, as you receive it, in a half minute, without any punching or other annoyance to try your patience.

Each Binder Will Hold Twelve Issues and Is Guaranteed. Your Money Refunded If You Are Not More Than Pleased. $2.00 each

Your Name Stamped in Gold

If you want your name stamped in gold on the cover of your binder add 50 cents to regular price. Stamping will delay mailing of binder about one week.

American Nature Association
1214 Sixteenth St., N. W.
Washington, D. C.

MAIL THIS COUPON—PRINT PLAINLY

THE AMERICAN NATURE ASSOCIATION
Washington, D. C. Date .....

Send me ..... Distinctive covers for NATURE MAGAZINE, for which I enclose $.....
If I am not unusually pleased I will return them to you within 5 days, and my money will be refunded to me.

Name .....

Street .....

City and State .....

STEPHEN TYNG MATHER

Just fifteen years to the day after he became officially connected with the National Parks as assistant to Secretary of the Interior Franklin K. Lane, and barely more than a year after ill-health forced him to resign as Director of the National Park Service he was instrumental in creating, Stephen Tyng Mather died at the Corey Hill Hospital at Brookline, Massachusetts at the age of 63. His sudden death on January 22 took place during the height of a nation-wide "Stephen T. Mather Appreciation" movement, designed to create in one of the National Parks a memorial in national recognition of his great service.

Stephen Mather is probably more responsible than any other single person for the National Park system of today. When appointed in 1915, the parks were inadequately administered as a part of the miscellaneous work of the Office of the Secretary of the Interior; they were not appreciated by the nation; there were no suitable facilities for their enjoyment by the people. He developed an orderly system of administration and with uncanny accuracy picked men of loyalty and vision to superintend the parks. A trained newspaper man, he saw the value of educational publicity, and succeeded in arousing the public from apathetic ignorance of the parks to become defenders of their integrity, and constant visitors. His enthusiasm carried private capital into the parks to provide suitable transportation and living quarters. When private enterprise threatened any of the beauties of the parks, or when additional sections were considered essential to the Park system, his personality and eagerness were successful in enlisting public and private aid. He fought endless legislative battles for the parks on Capitol Hill. And it is said among his friends that no one yet resisted Steve Mather when he came to get money for his parks. He gave hundreds of thousands of dollars of his own fortune to buy much-needed areas, later to turn them over to the Government. Part of Sequoia National Park and the site of the Tioga Road in Yosemite Park are monuments to his generosity and love for the parks. During his directorship from 1917 to 1929, seven new parks were created, among them Grand Canyon, Zion and Acadia, and the Shenandoah and Great Smoky Mountain projects approved by Congress and the President.

Mr. Mather graduated from the University of California in 1887 to go to the New York *Sun* as reporter, then left that field in 1893 to become interested in the borax business, which remained his concern until

FORESTS AND MANKIND

By
CHARLES LATHROP PACK
President of the American Tree Association
AND
TOM GILL
Forester

250 PAGES

64 ILLUSTRATIONS

. . . a book to own and to read time and time again by those who seek knowledge of the importance of the forests in their historical, social and economic relations to mankind.

Just Off the Press
Price $3.00

Order from
AMERICAN NATURE ASSOCIATION
WASHINGTON, D. C.

SAVE THE SONG BIRDS

With My 2-in-1 Bird Feeders
A Feeder in Winter— $2.50
Wren House in Summer Postpaid

FREE FEED WITH EVERY FEEDER

ALL FOUR $5.50 POST-PAID

18 room Martin House $21.00. Pottery Bird Bath, 24 inches high $8.75. 10 inch Bronze Sun Dial $6.00. Our prices are prepaid. Ask your Dealer or send for literature.

Roderick Payne, *Inc., "The Bird House Man"*
Box 501 Springfield, Ohio

THE CIRCUS MOUSE

in brownish grey, wears his red coat like a British Soldier and his necktie like the Queen's Chamberlain. On his tail he supports a brown parchment shade with lively design. It's a case of "love at first sight" with all who see him. Sent postpaid for $3.50. On approval of course.

THE BUTTERFLY BOX
63 Franklin St., Boston, Mass.

FUR RABBIT BREEDING
A Fascinating New Industry

Rabbit breeding is today the most promising of all live stock industries. Knowledge vital to success. Investigate and learn before starting with valuable stock. Our course of expert instruction spells success. Prospectus, breed catalogue, and interesting details 10c.

Ransom Fur Farm (*Pioneer Rabbit Breeders*) Geneva, Ohio

ATTENTION—NATURE LOVERS

There is nothing in the insect world more beautiful than the giant moths of our large silk-spinning species, with their brilliant colorings of blues, greens, reds and intermediate shades. It is a most interesting and beautiful sight to see them emerge from their silk cocoons in the Spring, with embryonic wings, which in 20 minutes, expand to full size.

Hundreds Bought Last Year

I am now ready to supply individuals, clubs, educational institutions, etc., with living silk cocoons from which *moths will emerge this Spring*, comprising our large moths: Polyphemus, Cecropia, Promethea and Cynthia, assorted at three prices 5 assorted cocoons for $1.00; 10 for $1.75; 15 for $2.25; 25 for $3.50; 50 for $6.00—Transportation charges paid to your address. Large color photographic reproductions of these moths, suitable for framing, will be supplied for 35c additional. In warm rooms some emerge during Winter. On request, I will include actual sample wings of 3 of these moths FREE to new purchasers who order now.

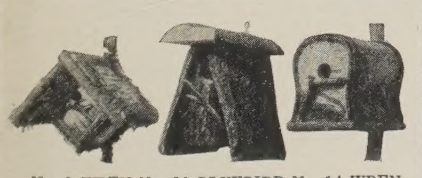
Ideal for nature study classes, kindergarten, boys and girls nature scout troops, schools, colleges and beauty-loving individuals. Mail your remittance today to

C. WM. WURSTER, Suite 1608-L, 104 Fifth Ave., N. Y. C.

SCOTTISH TERRIERS

Beautiful young stock now ready for delivery. Price reasonable.

Loganbrae Kennels
Rutland, Vt.



No. 8 WREN $2.30 No. 20 BLUEBIRD $1.30 No. 14 WREN $1.35

Bangs' Rustic Bird Houses

Attractive and Practical Bird Homes
Moderately Priced
Illustrated Circular Upon Request

A. G. BANGS, Dover Plains, N.Y.

All prices F.O.B. Dover Plains, N. Y. Net cash with order.

he turned his entire attention to the Parks. He has been the recipient of many honors during his lifetime, among them the Cornelius Amory Pugsley gold medal for outstanding public service in National, State, county and municipal parks in 1929.

During the past few months his friends, desirous of paying tribute to him, have been adding to a proposed $150,000 fund, to be expended in a testimonial to him. A gate at an entrance to Yosemite or a chapel in Yosemite valley has been proposed, and a national committee of 262 members is established to receive the flood of gifts. Those who knew Mr. Mather, who admired his sincerity, his wholesome idealism, and who fell under the influence of his single-heartedness and love for the out-of-doors, will, now more than ever, wish to take part in the movement; but they will feel that after all, he created his own monument, which will never be destroyed—the National Park System, and for this the entire nation will ever be grateful.

P. F. H.

Dallas Lore Sharp

The passing of Dallas Lore Sharp, so doughty a warrior for open spaces both of the field and of the mind, has reduced to startlingly small proportions that little band of leaders who ushered in the twentieth century. His beautiful personality and keen intellect left a deep impress on the country at large; his brilliant pen made thousands of friends for Nature.

In many ways, Dallas Lore Sharp was more the brother of Thoreau, Whitman and Burroughs than of the age of mechanization. He turned away from the present millrace of civilization to find solace in Nature and wisdom in her teachings. He rebelled with all the force of his vigorous pen against modern standardization in thinking, acting and living, and many fortunate enough to be his students at Boston University will carry the stamp of individuality he impressed upon them through life. Mullein Hill, his home in Hingham, Massachusetts, early became a mecca for naturalists and educators, and his influence was spread to all corners of the nation.

He began public life as a minister in 1895, but before the turn of the century had left this field to teach. From 1909 to 1927 he was at Boston University, where his lectures were the most popular of all. His deep love of Nature led him to express the results of his close and accurate observations in books, and a national reputation was built up within a few years. Many a schoolboy is familiar with "Wild Life near Home", "Watcher in the Woods", "Beyond the Pasture Bars", and a host of others. "The Boy's Life of John Burroughs" and "The Seer of Slabsides" are probably his most famous books.

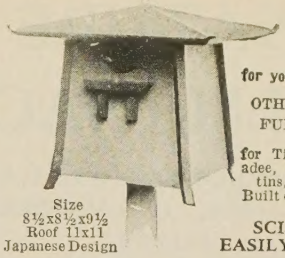
Nature Magazine had the privilege of carrying several of his articles, with drawings by R. Bruce Horsfall, who illustrated also many of his books. The last article,

Learn Photography at HOME

Make money taking pictures. Prepare quickly during spare time. Also earn while you learn. No experience necessary. New easy method. Nothing else like it. Send at once for free book, *Opportunities in Modern Photography*, and full particulars.

AMERICAN SCHOOL OF PHOTOGRAPHY
Dept. 1603, 3601 Michigan Ave. Chicago, U. S. A.

PERMANENT BEAUTIFUL BIRD HOMES



for your Bird friends

OTHER BEAUTIFUL DESIGNS

for Titmouse, Chickadee, Bluebird, Martins, Wrens, etc. Built of ¾" white pine

Size 8½x8½x9½ Roof 11x11 Japanese Design

SCIENTIFIC EASILY CLEANED

Wrens, Bluebirds, Price, F.O.B. Peoria, Ill. $4.00

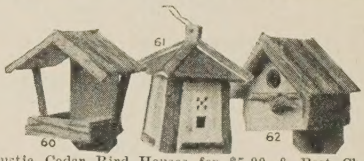
Catalog on Request

LEWIS P. KELLY, Dept. N, R.F.D. 4, Peoria, Ill.

COLLEGE COURSES AT HOME

Carry on your education. Develop power to initiate and achieve. Earn credit toward a Bachelor degree or Teaching Certificate *by correspondence*. Select from 450 courses in 45 subjects, including English, Mathematics, History, Education, Psychology, Economics, the Languages, etc. Write for catalog.

The University of Chicago
423 ELLIS HALL CHICAGO, ILL.



3 Rustic Cedar Bird Houses for $5.00 & Post Charges
Weight 10 lbs.
CRESCENT CO., Toms River, N. J.

ROCKS *and* MINERALS

A 40 page-illustrated-quarterly magazine devoted to the fascinating study of minerals and their collecting. Subscription U. S. and Possessions $1 per year. Foreign $1.25. Sample copy 35c

A subscription makes one a member of the Rocks and Minerals Association.

ROCKS and MINERALS
Dept. N Peekskill, N. Y.

BIRD LOVERS

Treat your birds to some new Jefco Houses. All houses are of wood, scientifically correct. Houses come in knock-down form and can be assembled very easily. Wren houses 75c. Flicker $1.25. Blue-Birds $1.00. Robin shelter $1.50. Small feed station $1.00, large $1.75. Four-family Martin House $2.00. Suet holders 50c. Nails and fastenings with all houses. All $1.00 or less sales add 10c postage, all $2.00 add 20c.

JEFCO HOUSES, Box 151, Maplewood, N. J.

DOG CARE SIMPLIFIED

Get this new 32-page illustrated booklet that tells all about raising dogs—valuable for amateurs and professionals alike. Sent with crisp samples of Miller's A-1 Dog Foods for 10c postpaid. Write today.

10¢

BATTLE CREEK DOG FOOD CO.
382 State Street BATTLE CREEK, MICH.

THE HANDY, AUTOMATIC GRAIN FEEDER FOR BIRDS

This feeder can be filled with any kind of grain. After filling bottle, hang feeder on a rail, invert feeder and insert bottle. Return feeder to proper position; it is now ready for use. Easily fastened to a tree or building. Complete with bottle, postage prepaid, **$1.50**

GLADSTONE CALIFF
1136 North 8th St., Quincy, Ill.

Squab Book FREE

PR squabs selling by millions to rich trade. Raised in 1 month. No mixing feed, no night labor, no young to attend. Sell for double chicken prices. **Write at once** for free 48-p. book telling **how to breed** and profit by **new fast sales method. PLYMOUTH ROCK SQUAB CO., 704 H St., Melrose Highlands, Massachusetts.** Established 29 years. Founder of the squab industry. Largest business in the world in pigeons and pigeon supplies. Reference, any bank. We ship breeding stock everywhere on three months' trial.

NATURE ALMANAC

by ARTHUR NEWTON PACK and PROF. E. LAURENCE PALMER

(The first ever published)

Just what everyone interested in Nature Education, Nature Organizations, Nature Study, Nature Bibliography, etc., etc., needs for reference and for the library.

312 PAGES
HANDSOMELY BOUND

PRICE ONLY $1.00 PREPAID

Edition Limited
ORDER NOW

AMERICAN NATURE ASSOCIATION
Washington, D. C.

which appeared in May, 1929, shortly before he was taken ill, concerned Mullein Hill. He wrote then, "There is much room now within the house. The table is still crowded sometimes for Thanksgiving dinner. By tea time, however, there are only two of us, only she and I, for the long evening by the open fire. Outside is the old November wind in the leafless trees. Up in the tower of the house we are likely to hear the whimper of the little owl."

Now there is only one.

A Friend Passes

Our birds have lost a fine friend and the country a valued citizen with the passing of Edward W. Bok. His career and his achievements call for little mention, here, so well are they known to Americans. It is particularly fitting that this philanthropist should find his last earthly resting place by the base of the beautiful Singing Tower and in the embrace of the bird sanctuary which he himself had created near Lake Wales, Florida. Few more lovely spots exist in this world.

A Sportsman

President Hoover gave further evidence of his true sportsmanship late in January by refusing to take advantage of a bill introduced into the Virginia Legislature to permit him to fish any season of the year in Rapidan River, which flows by his Virginia mountain camp. In advising the Legislature that he appreciated the courtesy, he said he had no intention of fishing except when others could fish.

The Original Etching *of the* Singing Tower

in the December issue was etched specially and exclusively for Nature Magazine by Benson B. Moore, noted wild life etcher. So far as we have been able to discover it is the ONLY ETCHING OF THE TOWER in existence. Thirty-five proofs were taken of this etching and the plate destroyed. There are left available nine proofs, all signed by the etcher.

These nine etchings will be sold
(as were eighteen others)
for $12.50 each

An opportunity to add a beautiful and increasingly valuable etching to your collection of pictures.

NATURE MAGAZINE
1214 16th Street Washington, D. C.

INDEX TO ADVERTISERS IN MARCH ISSUE

AQUARIUM
Beldt's Aquarium 196

BIRD HOUSES
Audubon Bird House Co. 200
Bangs, A. G. 203
Califf, Gladstone 203
Crescent Company 203
Dodson, Joseph H. 200
J. E. F. Co. 203
Kelly, Louis P. 203
New Jersey Fence Co. 200
Packard, Winthrop 201
Patch, A. H. Inc. 200
Payne, Roderick 203

BINOCULARS
Loring, J. Alden 138
Mirakel Optical Co. 138

BOOKS
Audel, Theo. 200
Bird-Lore Magazine 201
A. T. De La Mare Company, Inc. . . . 193
Forest & Mankind 202
G. & C. Merriam & Co. 201
Hough, Romeyn B. 200
J. Horace McFarland Co. 201
Nature Almanac 204
Nature Magazine Binder 202
Plymouth Rock Squab Co. 203

CAMPS
Camp Idyl Wyld 137
Cornucopia Home Camp 137
Maranacook Camp 137
Penn State College 137
Quanset Camp 137

EDUCATIONAL
American Institute of Psychology . . . 183
American Landscape School 200
American Schools Association 137
Am. School of Photo 203
Amore College 198
Federal School Inc. 201
University of Chicago 203

GARDENS & ACCESSORIES
Aiken, George D. 190
Alexander, J. K. 186
Allan, James 190
Allen, W. F. Co. 192
Alling, C. Louis 196
American Farm Machine Co. 196
Aquaproof Products Co. 196
Arlington Water Lily Garden 193
Atkins & Durbrow 187
Bassi Frères 192
Buskirk's Nurseries 185
Bobbink & Atkins 188
Burgess Seed & Plant Co. 195
Burgess Seed & Plant Co. 196
Burpee, W. Atlee 189
Champlain View Gardens 187
Collins, A. J. & Sons 196
Conrad-Pyle Co. 186
Dingee & Conard Co. 196
Dodropin Gardens 195
Dreer, Henry A. 195
Duckham, Wm. C. 188
Fisher & Masson 191
Forest Evergreen Co. 187
Gillet, H. M. 196
Gillett's Fern and Flower Farm . . . 194
Henderson, Peter & Co. 187
Hershey, John W. 189
D. Hill Nursery 189
Holland Bulb Company 191
Iowa Mfg. Company 196
Johnson's Water Gardens 190
Kunderd, A. E. 193
Le Gron Floral Co. 190
Long Beach Water Gardens 187
McKibbin, John H. 192
Marshall, W. E. 185
Mexican Trading Co. 186
Mills, F. B. 196
Norris, J. F. 189
Piedmont Forestry Company 196
Piedmont Forestry Nursery 195
Plantabbs Corporation 190
Rose Mfg. Co. 192
Schling, Max 194
Shaw, W. B. 194
Shumway, R. H. 192
Spring Hill Nurseries 190
Scott, O. M. 193
Storrs & Harrison Co. 186
Storrs & Harrison Co. 195
Terrell's Aquatic Farms 191
Three Springs Fisheries 189
Tricker, Wm. Inc. 186
Vaughan's Seed Co. 193
Walsh Tractor Company 195
Wayside Gardens 191
Western Maine Forestry Nursery . . . 195
Whitesbog Blueberry Nurseries 193
Wild Flower Preservation Society . . . 138
Wilmore, W. W. 187
Wilson, Andrew 185
Wohlert, A. E. 190

GIFTS
Butterfly Box 201
Butterfly Box 203
Gift & Photo Shop 196

HOTELS
Bellevue-Stratford 134
Manhattan Hotel 134
Piccadilly Hotel 134
Pinehurst 134

KENNELS
Battle Creek Dog Food Co. 203
Comrade Farm Kennels 201
Loganbrae Kennels 203

MISCELLANEOUS
Auburn Automobile 181
Bird Haven 200
Bok Tower 204
The Gem Shop 199
Lee, Gordon S. 138
Metal Arts Company 197
Ransome Rabbitry 203
Rocks & Minerals 203
Tax Sale Service 199
Terride Specialty Company 199
Wurster, C. Wm. 203

PHOTOGRAPHIC
Bell & Howell Co. 138
Folmer Graflex 139
Victor Animatograph 136

SPORTING GOODS
Chicago Roller Skate Company 199
Mead Cycle Company 199
Old Town Canoe 199
Taylor Instrument Company 197
Woods Mfg. Company 197

TAXIDERMY
Jonas Brothers 201
N. W. School of Taxidermy 200

TRAVEL
Anderson, H. A. 136
Chicago, Milwaukee, St. Paul & Pacific R. R. 133
Great Northern R. R. 135
South African Tourist Bureau 137
Union Pacific . . . . . Back Cover
West Palm Beach 136
Yosemite Park & Curry Co. 136

The American Tree Association stands for a constructive policy of forest protection and extension, to increase appreciation of forests as natural resources essential to the sound economic future of the country.

The Association directs encouragement of tree planting by the public; disseminates popular forestry news for the information of editors of the daily press; and compiles and distributes forestry news and reports on legislative progress for assistance of active foresters in the field.

The American Tree Association

CHARLES LATHROP PACK
President

ARTHUR NEWTON PACK
Secretary

PERCIVAL S. RIDSDALE
Treasurer

RICHARD W. WESTWOOD
Assistant Secretary

RUSSELL T. EDWARDS
Educational Director

CLUB WOMEN PLANT FOR AUTHOR OF THEIR OFFICIAL SONG

THE tree planting army is ready for a big year. It has some fine examples with which to keep step. Gen. John J. Pershing planted a memorial tree at Daweswood near Newark, Ohio. This marks the beginning of Pershing Avenue. Other trees planted at this estate of Beeman G. Dawes were placed by his brother, the ambassador to Great Britain, Kenesaw M. Landis, and James Cox and Vic Donahey, former governors of Ohio. In Alabama two miles of the Birmingham-Montgomery Highway have just been planted. The program was arranged by Mrs. C. L. Moss, conservation chairman of the Third District, Alabama Federation of Women's Clubs. Those taking part were Mrs. C. C. Adams, state president of the Federation; Mrs. Sadie Hernandez, state conservation chairman; H. M. Stauffner of the State Commission of Forestry; Robert D. Jordan, State Highway Department; Mrs. Perkins J. Prewitt, Third District; Samuel Earle, Birmingham Federation of Garden Clubs; Mrs. Henry M. Edmonds; Mrs. Elwyn Ballard, nature supervisor of the Birmingham schools; Mrs. Dora C. Fell; George Ward, Birmingham Audubon Society; Dr. Frank Willis Barnett, Birmingham News; Will F. Franke, County Board of Education; Charles M. Rice; Mrs. Louis Mackenzie; George L. Simcox and Miss Margaret Baskerville.

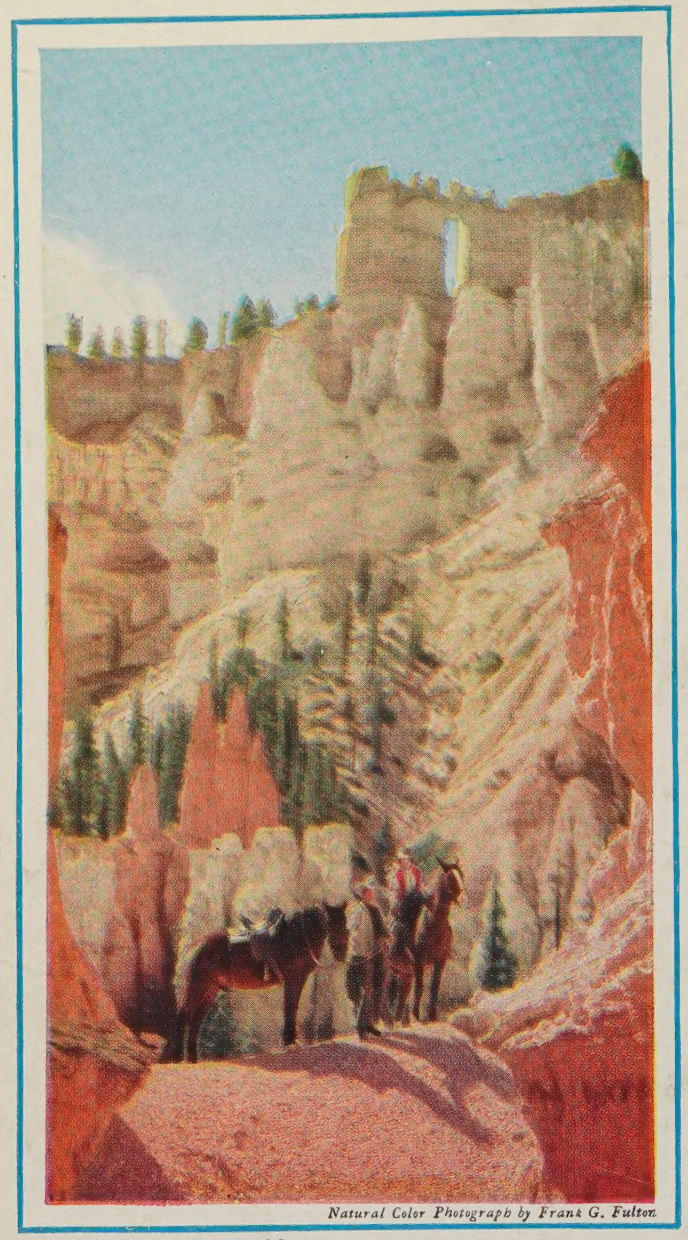
Mrs. John F. Sippel, president of the General Federation of Women's Clubs through the division of Forestry, Scenery and Memorial Tree Planting, of which Mrs. Charles Cyrus Marshall is chairman, is interesting clubwomen in planting memorial trees in honor of Katharine Lee Bates, who wrote "America the Beautiful." This is the conservationist's own hymn and the official song of the Federation. The first planting reported was at Suffern, N. Y., by the Women's Club. The tree, a spruce, was planted on the club house grounds. The Women's Club of Queens Village, N. Y., also planted a tree in memory of Miss Bates. The regular meeting of the club was held just prior to the planting, the program including an address by Mrs. Marshall, on keeping America beautiful. At the close of the meeting the club marched in a body to the school yard where the ceremony took place. A story of the poet's life was given and "America the Beautiful" was sung as the earth was spaded around the tree. The Fidelity Club at Calico Rock, Ark., also reports the planting of a Katharine Lee Bates tree. Others planted by this organization, Mrs. E. G. Sinclair, the president, says, are for Mrs. John D. Sherman, former president of the General Federation, and Mrs. Alice L. Stinson, former president of the Arkansas Federation.

IN MEMORY OF KATHARINE LEE BATES

Elm planted in the school yard at Queens Village by the members of the Woman's Club of that New York community

At Raleigh the second annual tree planting celebration of the American Business Club, for the beautification of Western Boulevard, has just been completed. Those who took part were: Gov. O. Max Gardner; Col. J. W. Harrelson, chairman of the Conservation and Development Department; R. A. Doughton, State Highway Commissioner; N. E. Edgerton, president of the Chamber of Commerce; and representatives of civic clubs, and United Daughters of the Confederacy and the North Carolina Art Society. Three thousand or more trees are being grown for the club in the State Forestry nursery and State Forester J. W. Holmes and F. H. Claridge, assistant forester, are lending their co-operation to the club in the tree planting project.

The American Tree Association wants further reports of all tree planting. The national honor roll is growing. New members are being found everywhere. With this tree planting is linked the highway beautiful idea. Many towns now see the great advantage of the beautiful approach to the municipality. Perhaps all your town needs is a leader. If so you are nominated. Ask the American Tree Association for free tree planting suggestions and tree day programs. Perhaps your school grounds need beautifying. Here enters the good citizenship idea. Tree planting lends itself to all events. The tree planting army will enlist thousands of recruits this spring. Will you be on the national honor roll?



Trail Scene in Bryce Canyon

THERE'S ONLY ONE WAY TO SEE

BRYCE CANYON

"SENSATION OF THE NATIONAL PARKS"

GRAND CANYON

—and Zion National Park, 3 national parks all in one motor bus tour. Any one is an unique vacation. To visit all three, and see Cedar Breaks and the Kaibab National Forest on the way, is the experience of a lifetime. Rates have been reduced for the five-day motor bus tour from Cedar City, Utah, the gateway, including all meals and accommodations at lodges.

UNION PACIFIC SYSTEM — THE OVERLAND ROUTE

This Year—

TRAVEL BY TRAIN

AND MAKE THE MOST OF YOUR VACATION

VACATIONS are always all too short. You can lengthen yours by several days if you go by an Overland Route train—and be freed from all cares and responsibilities en route.

Each year the West is more and more the nation's playground. It offers an unlimited variety of places to go, things to see, ways to rest and recreate. The Union Pacific serves 15 National Parks and reaches more of the scenic West than any other railroad including, besides Zion-Grand Canyon-Bryce Canyon National Parks—California and Hawaii—Colorado—Pacific Northwest and Alaska—Yellowstone-Grand Teton National Parks. (If it's a National Park, it's probably on the Union Pacific.)

LOW FARES—FINE TRAINS

Summer fares starting May 15 and June 1 are little more than half the usual fares.

Escorted all-expense tours to the West—the convenient, carefree way to travel.

For complete information and illustrated booklets about the great National Parks and other Western regions, mail the coupon below.

C. J. Collins, General Passenger Agent, Dept. 38 369
Union Pacific System, Omaha, Nebraska

Please send me complete information and booklets.

I am interested in a vacation trip to _____

_____

Name _____ Street _____

City _____ State _____

If student, state grade _____

THE OVERLAND ROUTE

UNION PACIFIC SYSTEM